Sun Expo Preview: See Page 70

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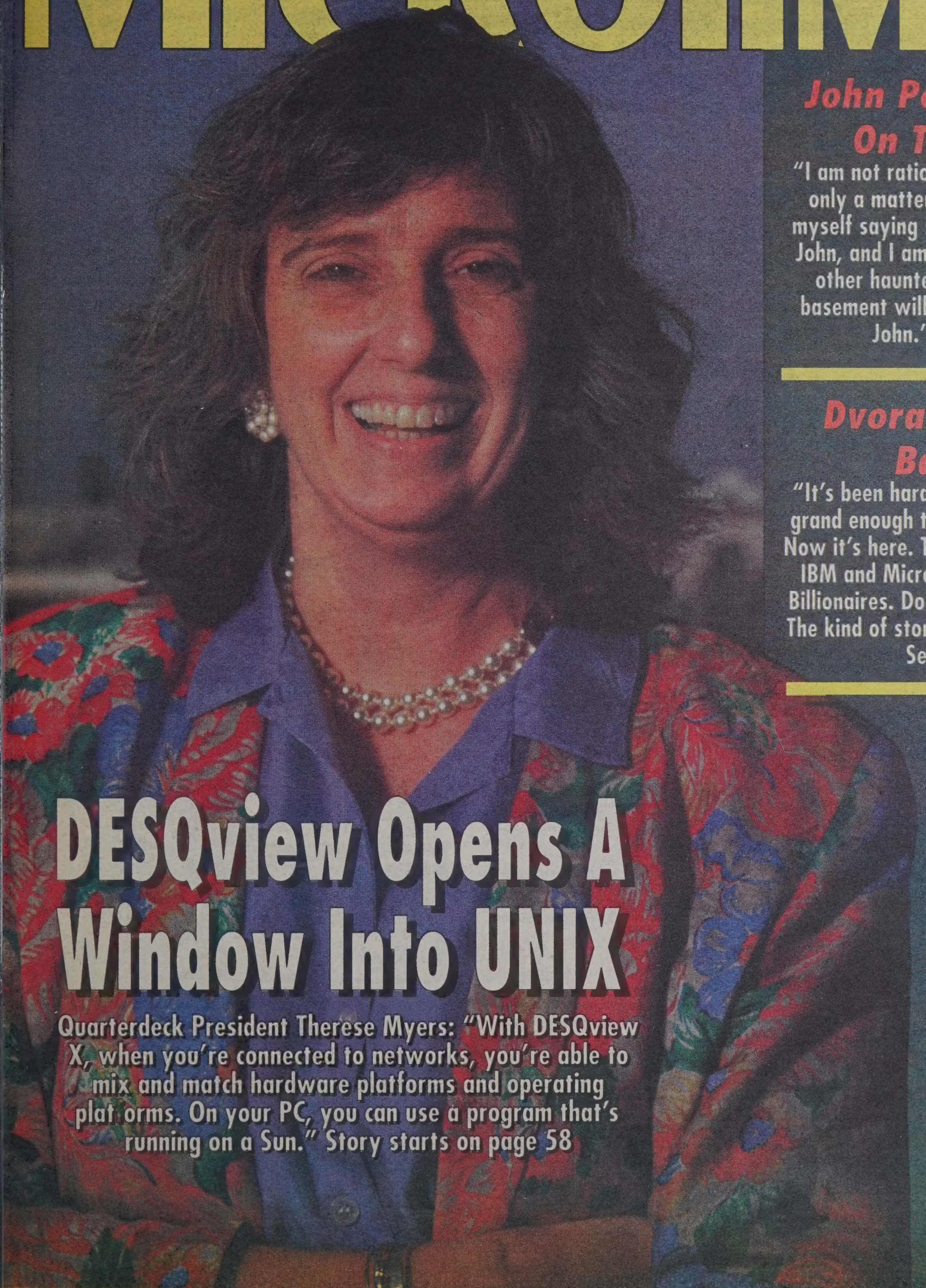

John Perry Barlow On The NeXT:

"I am not rational on this subject. It's only a matter of time before I find myself saying something like, 'Hi, I'm John, and I am a NeXThead.' And the other haunted souls in the church basement will clap and murmur, 'Hi, John.'" See page 87

Dvorak On Gates Bashing:

"It's been hard for the media to find a grand enough theme to go after Gates. Now it's here. The great battle between IBM and Microsoft. Titans. Paranoia. Billionaires. Dominance and submission. The kind of stories people like to read." See page 246

Wayne Yacco Builds A Network Server:

"Putting together your own server will give you an invaluable familiarity with your hardware." See page 50

DESQview Opens A Window Into UNIX

Quarterdeck President Therese Myers: "With DESQview X, when you're connected to networks, you're able to mix and match hardware platforms and operating platforms. On your PC, you can use a program that's running on a Sun." Story starts on page 58

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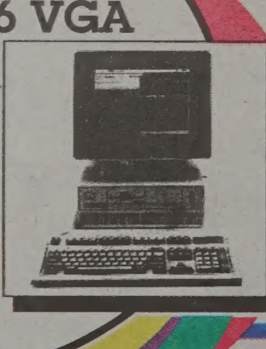

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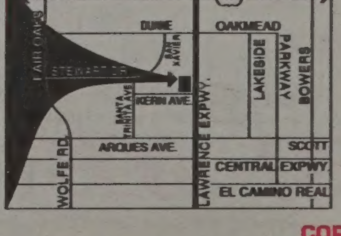

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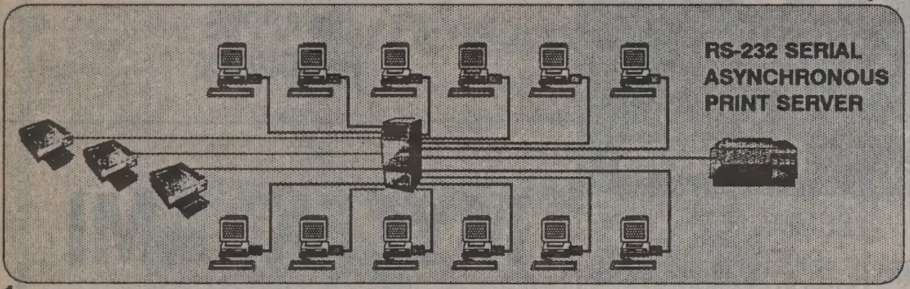

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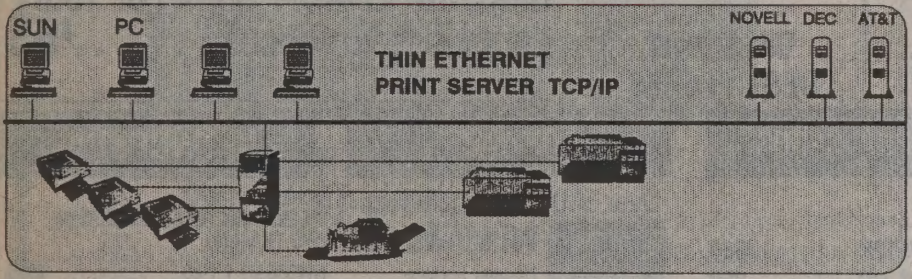

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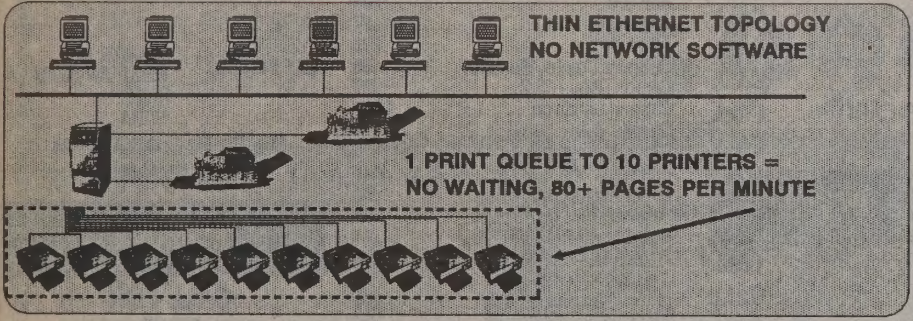
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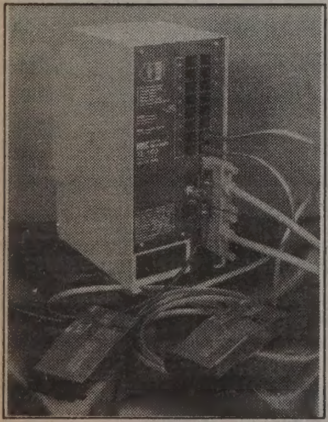

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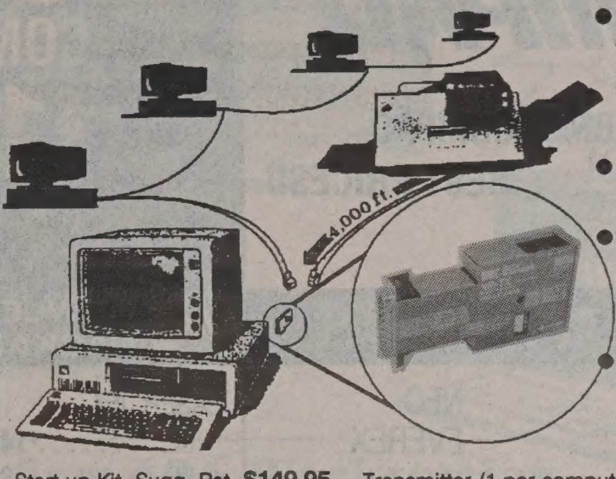

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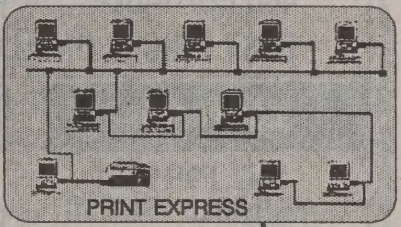

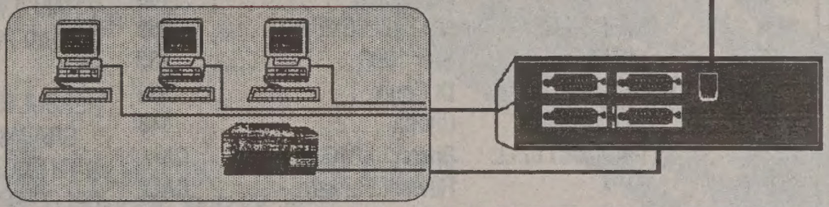

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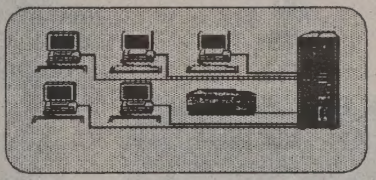

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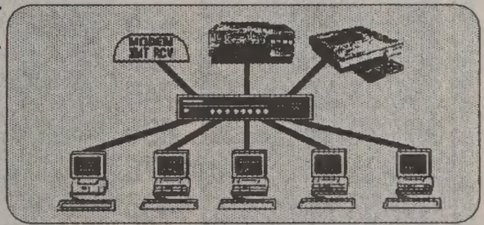

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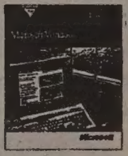

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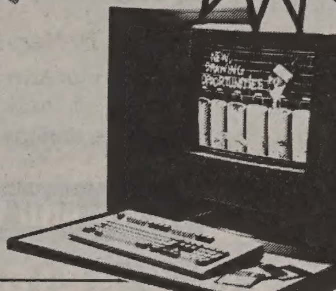

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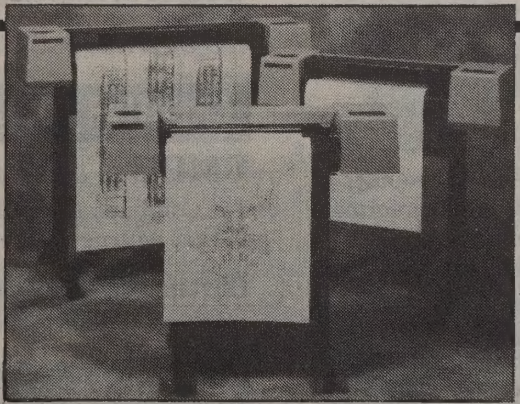

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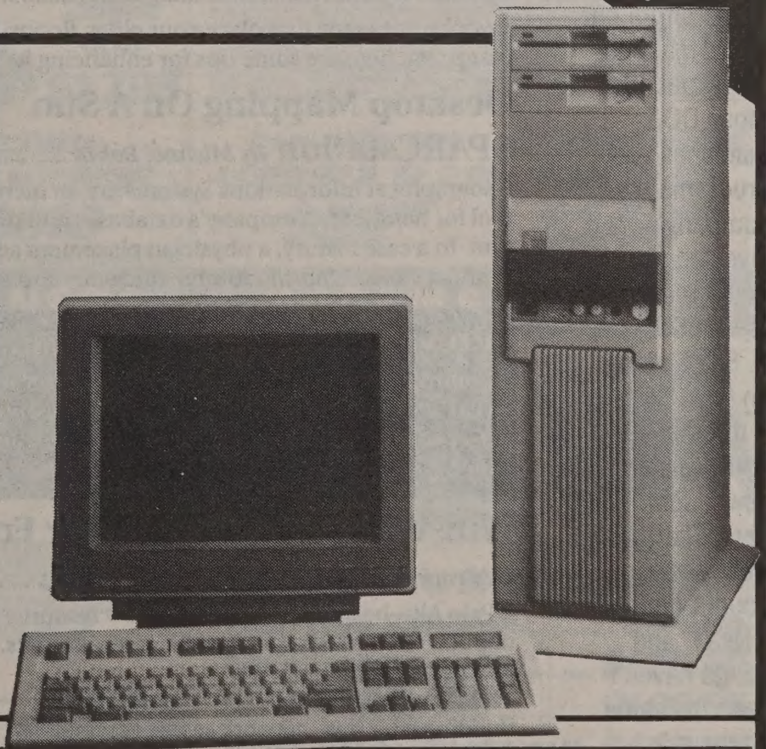

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A NOTE FROM THE EDITORS

In its ten-year existence, Santa Monica-based Quarterdeck Office Systems has won renown and a huge customer base among PC users determined to get the best performance out of their hardware without spending a lot of money on the latest new gizmo. Well, now there's more good news for those independent-minded consultants, programmers, and office gurus who see UNIX as the way of the future but aren't ready to throw out all those DOS machines and programs the company's invested so much money in—DESQview X. Story starts on page 58.

In other UNIX-related news, John Perry Barlow went and bought himself a NeXT, and things haven't been the same up there in Wyoming ever since… Story starts on page 87.

—ME

COVER STORY

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Cover Photo: Ann Summa

Quarterdeck President Therese Myers on DESQview X, emerging standards, and the world's most fanatical user base.

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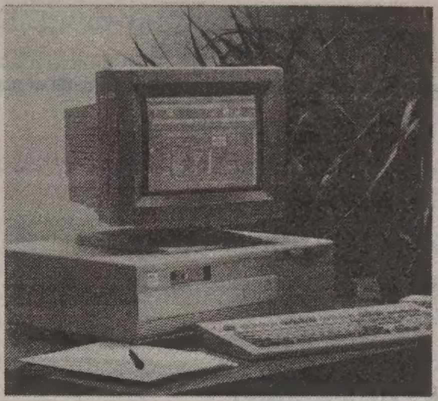

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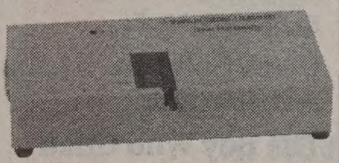

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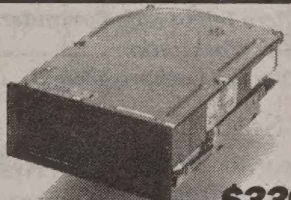

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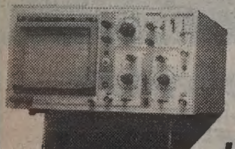

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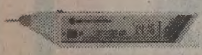

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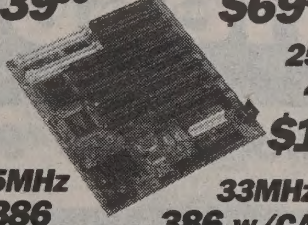

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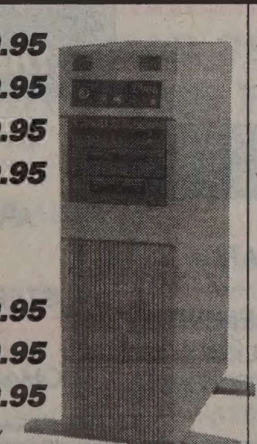

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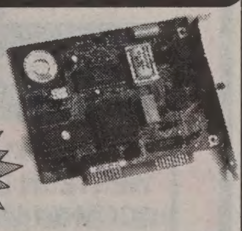

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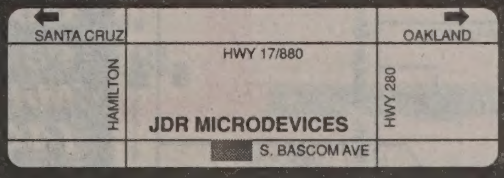

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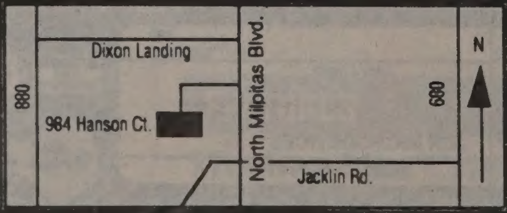

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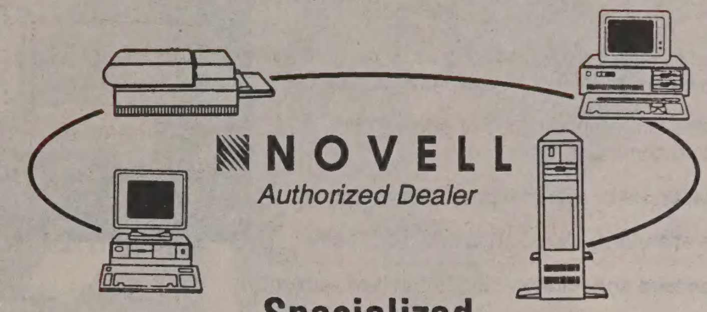

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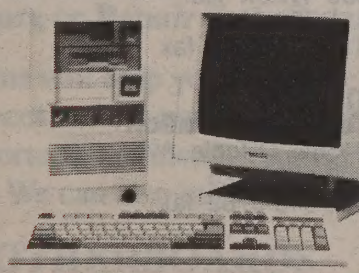

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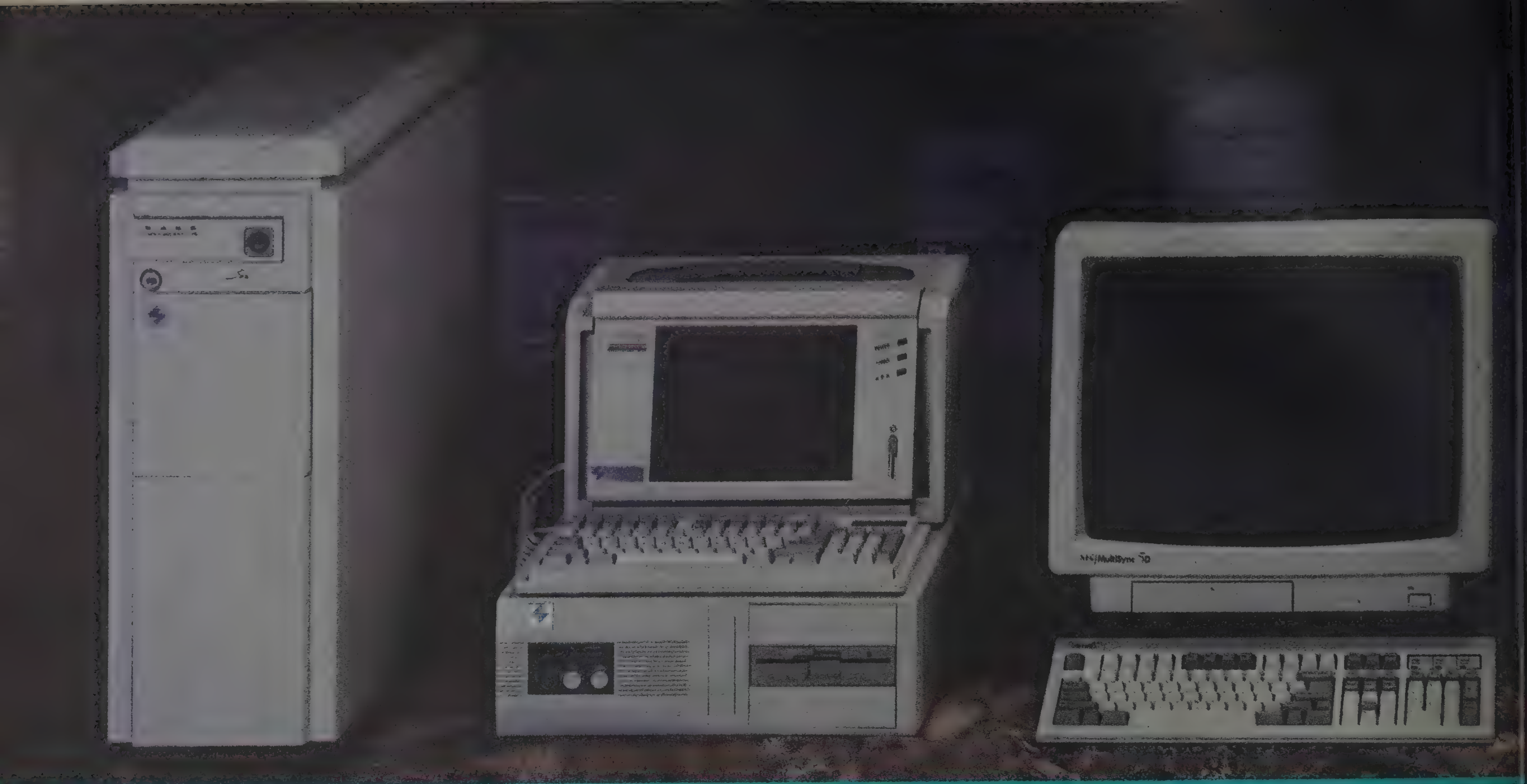

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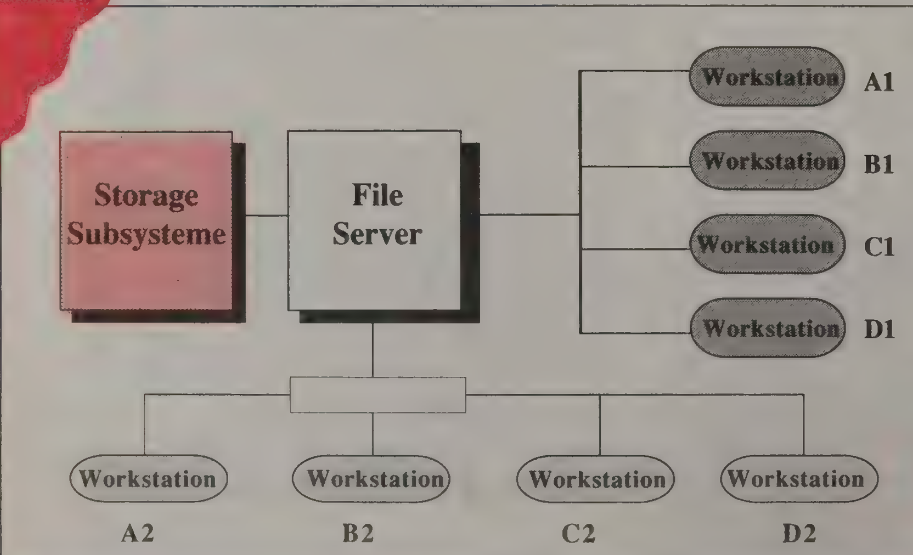

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- 1MB RAM Exp. to 8MB at 80ns
- Baby at Case with 4 Bays

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- Baby AT Case with 4 Bays

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SYSTEM PACKAGE

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- Win Amber Monochrome Monitor

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THE NEW GENERATION OF NOTEBOOK

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80Key with 12Func. Keyboard
Carrying Bag
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LETTERS

ENCRYPTION/PRIVACY CONCERNS

Thank you for Jim Warren's "Practical Privacy Protection, Unless Congress Prohibits It" (Issue #83). The issue of privacy is an important one. In the article, Mr. Warren mentioned pending legislation which would require all services carrying encrypted messages to make available a clear-text copy to the government. I immediately wrote my senate and congressional representatives.

I think this law threatens to undermine the confidentiality of some business transactions. What if, for example, the same mentality that created Watergate and the Iran-Contra affair was directed to exploit inside information to generate profits from stock trading? I can just see insider stock trades generating profits to support other causes which Congress has outlawed funding through legitimate means. A legitimate encryption system makes this sort of activity less convenient.

If, as Mr. Warren suggested, a "back door" to encryption algorithms is used as a method to comply with such a law, hackers could penetrate the security of encrypted systems with greater ease.

Further, the law would (obviously) allow the government to review private messages. Unfortunately, the current Supreme Court has been steering a course toward a United States where there is no "right to privacy." If a law like this proposed bill got through Congress, it would forewarn of even more restrictive laws which would further jeopardize civil liberties.

Thanks for making readers aware of such important issues.

Jon Cereghino
Mountain View

(Update: the language in Senate Bill 266, which stated "providers of electronic communications service equipment and manufacturers of electronic communications service equipment shall ensure that communications systems permit the government to obtain the plain text contents of voice, data, and other communications when appropriately authorized by law" has been removed.—eds.)

YOUR FIRST COMPUTER: ANOTHER VIEW

This is another of those "I like your magazine, but…" letters.

I do read *MicroTimes* regularly. I find the articles informative, and the overall tone of the magazine suits me. Unlike others in the field, even glossy publications, you have recognized that SPARC computers are expanding beyond the engineering workstation class into the "personal" computer arena. Though sometimes the articles contain technical errors or omissions, they are nearly always minor. The personal preferences of the contributing editors don't reduce the integrity of the publication, since those preferences are balanced by each other.

However, I have come to abhor articles like Mike Markowitz's "So You Want To Buy A Computer" (Issue #83/84). I have never seen this issue handled correctly in print. I have been a computer professional for over a decade, and have many times, both privately and professionally, been asked "what computer should I buy?", or some variation. No one has regretted following my advice.

The first question must always be "What do you plan to use the computer for?" I ask if there are specific program title requirements. Without that information, no satisfactory choice can be made. For some people, "no computer" is the best choice. For others, the choices are constrained by requirements for compatibility with a system in use at a workplace. Software is always the driving force in good hardware buying decisions.

The IBM PC, its successors, and clones did not become "popular" because either the hardware or operating system is, by any rational measure, "good." The original PCs and later XTs were outclassed in performance by both the higher-end CP/M-80 systems (at comparable prices), and by non-clone 8086-family computers. The operating system is at least as "user-hostile" as CP/M-80, even today. However, the "IBM" connection gave software vendors confidence that applications written for the "least-common-denominator" PC could be developed and supported at a reasonable cost. And the availability of the software provided the rationale for end users to buy the systems. There were several generic MS-DOS systems (the Tandy 2000 especially) that had higher-density storage, superior graphics, and faster processors than the PC or XT, and were, therefore, not compatible, and never sold because the PC software didn't run on them.

Apple gained a market for the Mac, even though the original Macs were low on performance, by providing an environment for software vendors to produce superior desktop publishing applications. It also ran other applications, such as spreadsheets, acceptably. But it was the software that drove writers, editors, and publishers to buy the Macs, instead of the more common PC clones. Now, of course, there is a complete spectrum of application software for the Mac family.

Despite Commodore's "anti-marketing," the Amiga sold to people who need both a graphical interface for non-computer users and a command line for "power users." The software community then provided an unequalled variety of graphic, video, and music software, which has pushed the Amiga into preeminence in those markets. It is still the only true "multimedia" system, and, like the Mac, has every type of application software.

"First computer" choices, then, depend on the application. "I have to run Lotus" means a clone, the best the budget allows. "I want to publish a newsletter," despite PC and Mac gains, probably means a Mac. However, in the absence of any binding program title, the Amiga, since it can also run both Mac and PC software if required, is easy to use, and has as large a software base as any other platform, is a highly satisfactory choice for a first purchase.

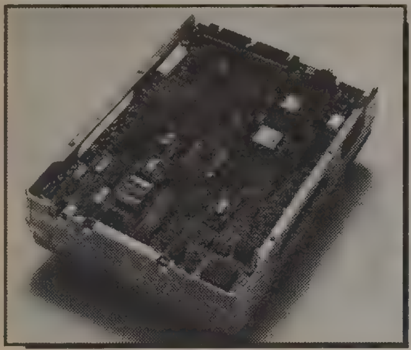
Only after the application has determined the platform do the issues of memory, disk, and display requirements become important. The *MicroTimes* article, like so many before it, gets the fundamental order of selection backwards. This is why there are so many computers rotting on desks, or in closets, or for sale six months after the purchase.

Dan Taylor
Tustin

WHOLESALE

CSC

HARD DRIVES



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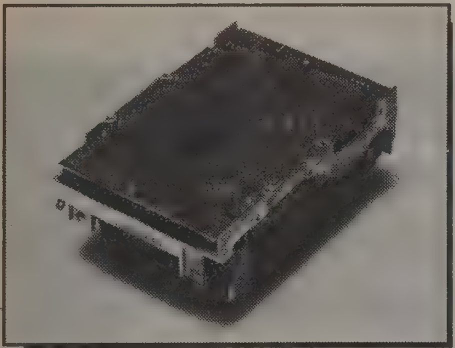

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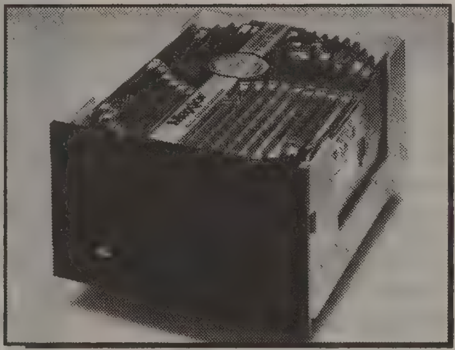

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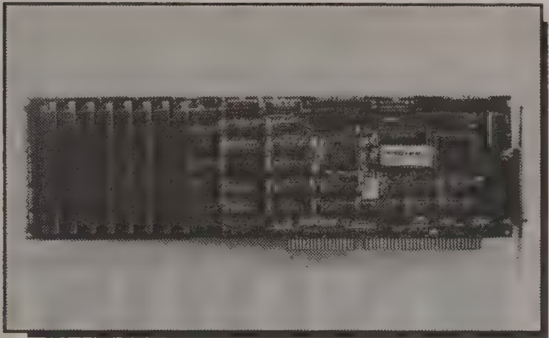

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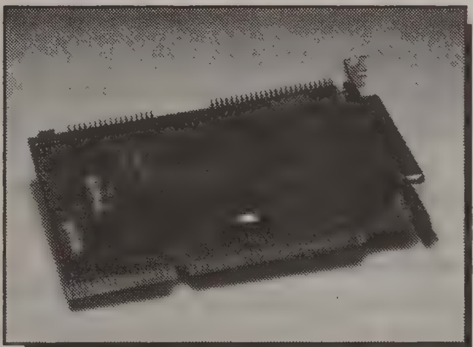

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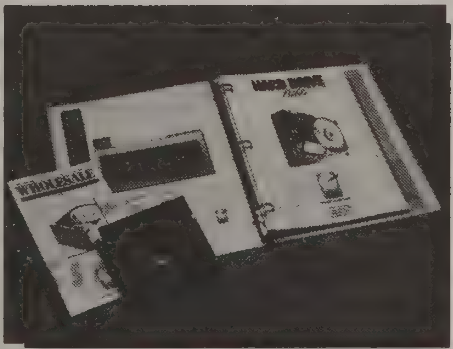

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INDUSTRY INSIGHT

MS-DOS v5 and PC Upgrades

BY PAUL HOFFMAN

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

DEBUT OF DOS 5: NEW BLITZ FROM MICROSOFT

The advertising blitz has begun. The newest release of MS-DOS, v5, is the first to be backed up with a gigantic advertising budget, rumored to be over $10 million.

And why not? If a significant proportion of the fifty million MS-DOS users buy upgrades to v5, Microsoft stands to gain over half a billion dollars in new revenue this year. Not bad for an upgrade with many features that have been commercially available for years. If you got tired of the Windows 3 hype, you'd better find a good cave, because the MS-DOS v5 hype will be hard to miss for a long, long time.

For people who never use third-party add-ons, v5 marks a significant improvement in MS-DOS. Version 5 is no longer a memory hog, particularly if you have an 80286 or better and more than 1MB of RAM. Instead of eating up almost 100K of memory, the new version can be configured to use about 20K, leaving much more room for memory-resident (and memory-hungry) programs like network drivers and utilities in addition to your regular programs. In fact, many of these memory-resident programs can also be loaded into "high memory" leaving even more room for traditional MS-DOS programs to run.

Other significant new features include safer backup and formatting, a better "shell" program for starting programs and managing files, and task switching.

REALITY CHECK: PEOPLE HAVE IT NOW

However, most people do use third-party add-ons. In fact, utilities that perform these features are among the best-selling software available. For example, QEMM-386, a program from Quarterdeck that gives you similar capabilities to the new MS-DOS memory management software, consistently sells better than Lotus 1-2-3. So many people already use these utilities that Microsoft decided it needed to have a giant advertising campaign to generate enough of an installed base for the upgrade to make MS-DOS 5 the standard version.

If you're the type of user who's already bought a high memory manager and a package such as PC Tools or the Norton Utilities, you may be hard pressed to come up with a solid reason to upgrade to MS-DOS v5 immediately. Of course, you will probably upgrade at some point in the future since everyone will, but you can probably wait out the first six months or a year while everyone who lined up in front of Egghead to be the first on their block with v5 grapples with compatibility problems. Few programs will require v5 for at least a year or two, and you will probably be safe with your current configuration.

Mind you, Microsoft has extensively tested MS-DOS v5 and there are not that many problems known; however, that was also true of Windows v3, and it turned out that there were many more problems than they expected. In addition, many software manufacturers who had access to beta test copies of v5 have already come out with fixes to compatibility problems. The most troublesome programs will be memory-resident programs that do not take well to the new memory reorganization scheme, but other programs may have problems depending on other programs that might be running. And, given the experience of Windows v3 users, it remains to be seen how well the task switching will work and who will really want to use it.

> **Computer manufacturers will start supplying MS-DOS v5 immediately with new systems (if they offer any version), but they cannot upgrade you. Only Microsoft and IBM can. IBM will offer upgrades only to IBM customers.**

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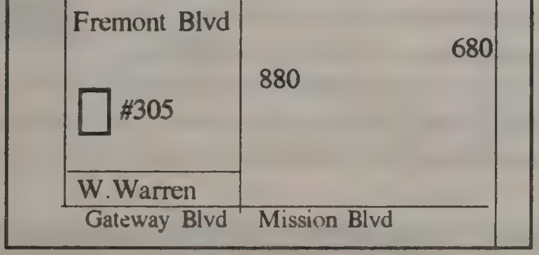

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GETTING YOU TO UPGRADE

Microsoft's upgrade strategy is new for this release. You can buy upgrade kits from your local computer store or through mail order for $100 list (the average street price seems to be around $75 to $80). Note that this is an upgrade-only package: if you don't already have MS-DOS on your machine, this upgrade won't do anything for you. Computer manufacturers will start supplying MS-DOS v5 immediately with new systems (if they offer any version), but they cannot upgrade you. Only Microsoft and IBM can. IBM will offer upgrades only to IBM customers. This has angered many hardware manufacturers who wanted to offer their own upgrade but Microsoft stood firm: the money goes into Microsoft's pocket only.

Of course, there is no way for the upgrade package to know whether the copy of MS-DOS that is being upgraded is legitimate. Microsoft knows full well that a large percentage of the copies of MS-DOS out there were stolen, that is, never paid for. PCs are still the only major computer for which you have to pay for the operating system separately from the computer. Microsoft has lost huge amounts of money to people who "borrow" or "just copy" the operating system from a friend and never pay for it. By convincing most people that they have to upgrade to MS-DOS v5, Microsoft will be able to make back lots of lost revenue.

If you got tired of the Windows 3 hype, you'd better find a good cave, because the MS-DOS v5 hype will be hard to miss for a long, long time.

You can buy the upgrade kit almost anywhere. National chains like Egghead had the upgrade on the shelves the first day it was officially announced. Microsoft is hoping that most people decide to buy the upgrade whether or not they ever bought the original package.

The question of who needs to upgrade will be debated for many months. If you don't have any problems with your current setup, you probably don't need to upgrade soon. If you are feeling the memory crunch, have more than 1MB of memory, and aren't using any third-party memory manager, upgrading may be the fastest way of getting more memory available to your MS-DOS programs (assuming you don't hit any compatibility snags).

Taking a wait-and-see attitude for a few months may be a good idea for most people to make sure that there aren't any hidden problems that only surface after there are millions of people using it. If you are on any on-line services like CompuServe or Prodigy, be sure to watch the MS-DOS conferences to see what problems other people are having.

THE EFFECTS ON THIRD-PARTY DEVELOPERS

The new version of MS-DOS does not sound the death knell for vendors of add-ons that provide the new features. If these companies are smart, they'll come up with features that Microsoft didn't put in and offer low-cost

Solving The PC Upgrade Conundrum

You've bought a clone with a 20MHz 80386 chip and you want to upgrade to a faster CPU or an 80486: what do you do?

Unfortunately, it depends heavily on who made your system. For most people, the answer is to buy a new machine. Some major manufacturers allow you to upgrade by adding a "daughter-board" to your PC, but at a cost nearly as great as buying a full no-name clone with the better CPU. You can also buy a replacement for your motherboard, but this too often comes close to the cost of buying a new system, and it takes some significant hands-on surgery.

RD Labs of Manhattan Beach has come up with a much more elegant solution. They've designed a compact motherboard that lets you use any 80386 or 80486 up to 33MHz. To upgrade your system, you pull out the old CPU, drop in a new one, and change a few jumpers. That's all. RD Labs sells motherboards to clone makers, not to end users, so you need to buy from one of their manufacturers to get the benefits of the system. However, if you have such a PC, upgrading yourself could take less than ten minutes and costs you no more than the cost of buying the new CPU.

The RD386/486 motherboard offers clone companies about as much flexibility as is possible in a PC. The board will take Intel 80386DXs (16, 20, 25, and 33MHz), Intel 80486SX (25 and 33MHz), Intel 80486DX (25 and 33MHz), and AMD AM386 chips. It has seven standard ISA slots for expansion cards, and can accommodate math coprocessors. It can handle up to 32MB of RAM using SIMMs, and up to 256K of cache. You can choose from Phoenix, AMI, or AWARD BIOSes, and the board fits into the smaller "Baby AT" case size.

The benefits for the end user should get many small clone companies interested in the RD Labs design. One problem that plagues many small stores is that customers don't come back for upgrades if they find a better price somewhere else. With systems based around this type of upgradable motherboard, a store with reasonable prices on CPUs can get much more repeat business.

There will probably be competition for the RD Labs design, maybe from major clone companies. As Intel downplays the 80286 more, people who are forced to trash their old systems in order to get better performance will start to demand a better upgrade path than what is currently available. With operating environments like Windows v3 and OS/2 v2 demanding faster CPUs, more people will see the need for cheaper and easier upgrades, and the low-end stores may be the first to offer them.

With operating environments like Windows v3 and OS/2 v2 demanding faster CPUs, more people will see the need for cheaper and easier upgrades, and the low-end stores may be the first to offer them.

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2114L25	**1.15**	1024x4
2114-45	**1.05**	1024x4
2148-3	**1.95**	1024x4
2149-35	**3.75**	1024x4
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20C71-25	**6.75**	4096x4
6168-45	**3.25**	4096x4
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6264LP15	**3.95**	8192x8
6264-10	**4.75**	8192x8
6264-15	**3.75**	8192x8
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62256LP10	**6.75**	32,768x8
62256LP15	**6.25**	32,768x8
628128LP10	**32.95**	131,072x8

DYNAMIC RAMS

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4816A4	**.55**	16,384x1
4416-12	**2.25**	16,384x4
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4164-20	**1.25**	65,536x1
41264-12	**6.95**	65,536x4
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41464-12	**2.75**	65,536x4
41256-10FL	**2.55**	262,144x1
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41256-15FL	**2.35**	262,144x1
41256-80	**2.15**	262,144x1
41256-10	**1.95**	262,144x1
41256-12	**1.85**	262,144x1
41256-15	**1.75**	262,144x1
41257-80	**3.75**	262,144x1
41257-12	**3.25**	262,144x1
51258-80	**4.95**	262,144x1
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BC375	**249.95**	375VA, 4 Outlets, UL Approved	PS/2-30, PS/2-50, XT/Compatible	6.5 x 5.25 x 14	19.5 lbs.
BC500	**299.95**	500VA, 4 Outlets, UL Approved	PS/2-50, 286, XT/Compatible	6.5 x 5.25 x 14	23.5 lbs.
BC500LAN	**339.95**	500VA w/ LAN Connector, 4 Outlets	LAN Workstation, PS/2, 386	6 x 7.5 x 17	37 lbs.
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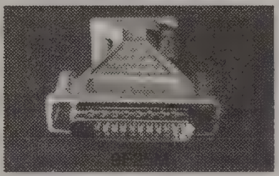

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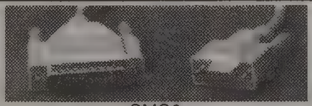
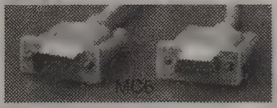
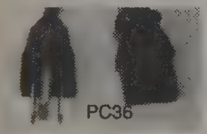
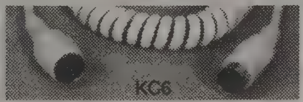
COMPUTER CABLES

Centronics


SMC6


MC6


PC36


KC6

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C6MF	**12.95**	**11.95**	Centronics Male-to-Female Cable	6'
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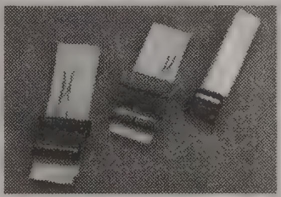
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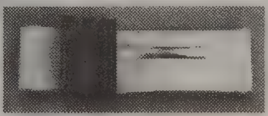
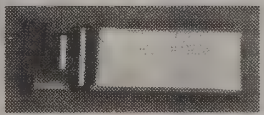

E6255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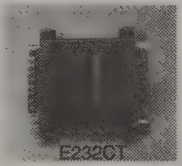
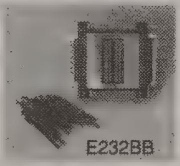
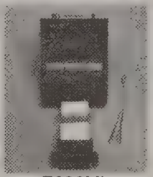
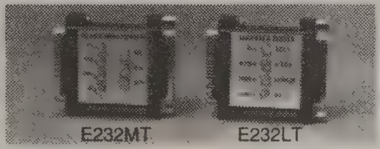

E232CT


E232BB


E232ML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upgrades to their current customers. Fortunately, Microsoft didn't do a spectacular job on the new features, and the add-ons already have many advantages over plain MS-DOS v5. However, the utilities companies will have to work harder to convince low-end users that their packages are desirable additions to v5.

Some companies have already started their counterattacks. Symantec and Central Point Software both released significant new versions of their all-in-one utility packages earlier this year and both have had high upgrade rates. Quarterdeck is expanding its line of products and is working on a version of QEMM-386 designed to make using the newly freed memory even easier (MS-DOS v5 makes you understand a great deal in order to rescue the additional memory). Most of the shell companies already have better front ends than the DOSSHELL program that comes with v5. Their markets may erode a little, but probably not significantly.

Clearly, there are tens of millions of users who do not have any of these utilities and will benefit from MS-DOS v5's new features. These people generally fall into two categories: those who don't know or are afraid of buying utilities and those who work in companies with centralized computing policies that prevent them from using these utilities. For these people, the upgrade to MS-DOS v5 will probably make their PCs much more useful and not take much thought. Third-party utilities developers already have a hard time reaching these people, and v5 may lock them out of that market unless they develop new features that aren't even addressed by v5.

WHERE DOES THIS LEAVE OS/2?

There is a second important reason that Microsoft is pumping MS-DOS so hard: to lessen interest in OS/2 for a few years until their NT version is ready. By positioning MS-DOS and Windows as all most users want, they can hurt IBM's release of OS/2 v2 later this year. Although hurting OS/2 v2 may seem silly for Microsoft, remember that Microsoft does not stand to make much money from it, and its acceptance may impede acceptance of OS/2 NT in a few years.

> **By positioning MS-DOS and Windows as all most users want, Microsoft can hurt IBM's release of OS/2 v2 later this year.**

Microsoft will make most of its money on OS/2 NT from sales to hardware manufacturers, not end users. These companies are starting to worry that, with the product so far off in the future, there won't be much demand for NT with a good OS/2 coming from IBM and better and cheaper UNIXes coming from many manufacturers. It is to Microsoft's advantage right now to make DOS v5 and Windows seem like "all you need" until Microsoft is ready to launch the next major step, namely OS/2 NT. ■

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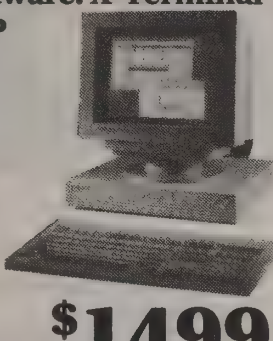

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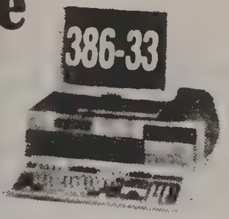

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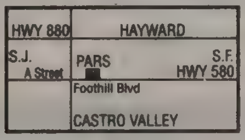

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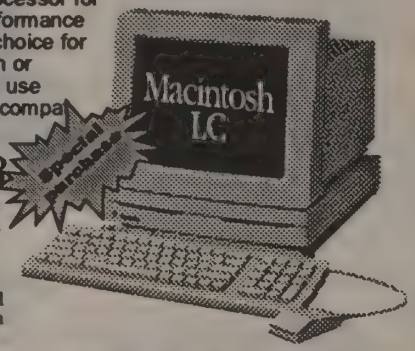

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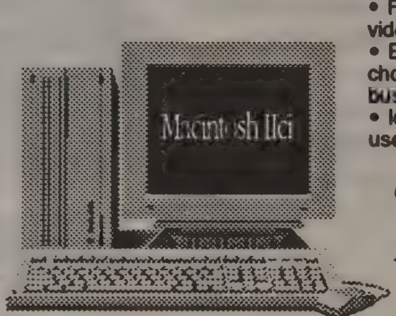

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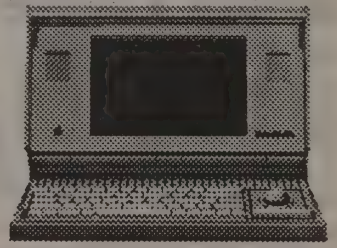

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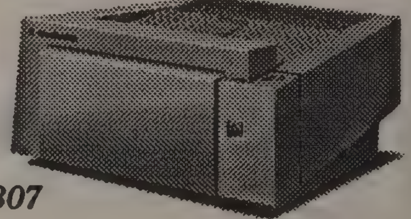

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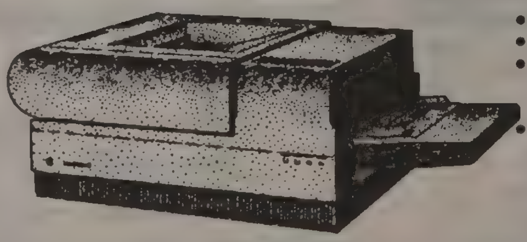

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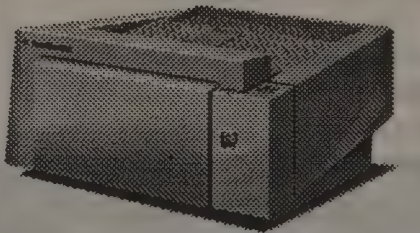

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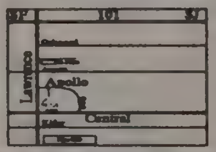

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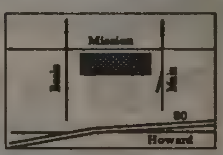

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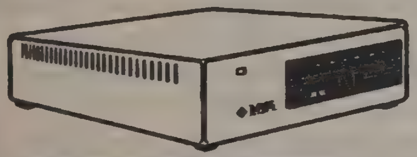

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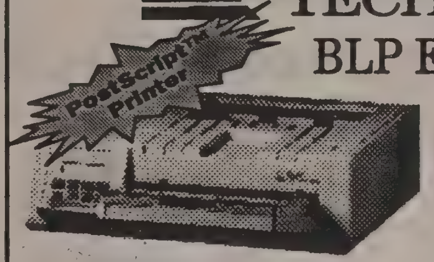

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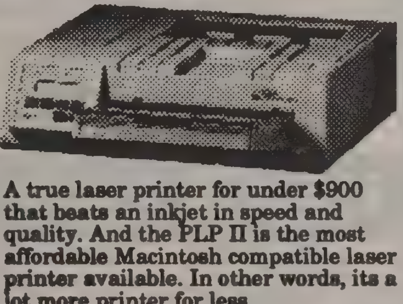

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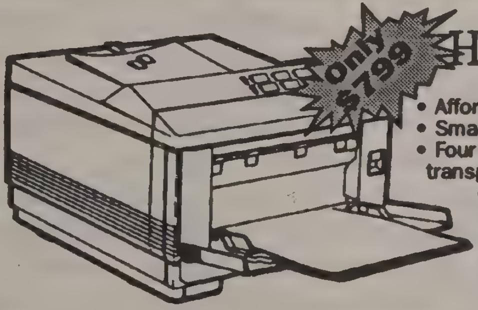

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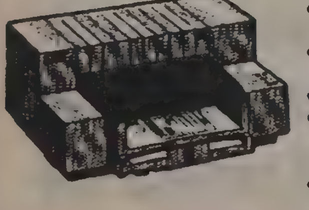

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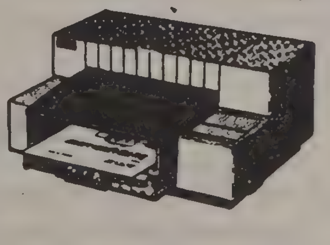

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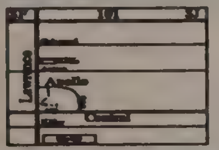

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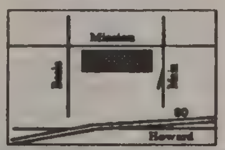

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Of Telco, Crypto, Promo & Mo'

Phone Pitches, Privacy Protection, And What The FBI's Really *Worried About*

BY JIM WARREN

This column addresses things that aren't, but could be—as soon as you make 'em happen.

MORE SOLUTIONS TO JUNK PHONE CALLS

My March column mentioned "guerrilla warfare" against computerized telephone sales calls. Ralph Moredock of Campbell, California, offered some *delightful* alternatives—both "manual" and electronic:

Upon detecting an unwanted [human] phone solicitation, he asks for the caller's name and address, stating that he charges $100 per minute for his time and wants to know where to send the bill. (I recall reading of a company that files legal claims against phone hustlers on behalf of their clients who bill callers in this manner. Beats the hell out of chasing ambulances.)

REALIZABLE FANTASIES

I tried this "Moredock Response." The solicitor was so shocked that he completely forgot his sales pitch and hung up almost instantly. Hmmm—gotta make sure I get that address first, though.

A second alternative—a technically realizable fantasy—is a phone signal that causes the c.o. (the local central telephone switching office) to immediately disconnect your phone line from a caller. Right now, if you hang up but a caller doesn't, you must wait some period of time after hanging up before you can use your phone. A fast-disconnect is especially needed for computerized hustles that may dumbly drone on, long after you hang up—so you can make emergency calls, or just use the phone service for which you pay. Could it be implemented with the "*" or "#" buttons?

Then there's Ralph's guerrilla warfare fantasy—a "blue box" that, when activated, reconnects the unwanted incoming call to a 900 number, causing per-minute charges to be billed to the caller through the phone company. Now *there's* an interesting 900 service the RBOCs could sell to consumers! [RBOC = regional bell operating company, the regulated companies that offer local phone service; sometimes called the Baby Bells, created by the court-mandated breakup of AT&T's national phone monopoly]

ENCRYPTION ERRATA

In last month's column I said IBM and the NSA never released the source code for the federally adopted—but brain-damaged, provably insecure—Data Encryption Standard (DES). I wuz wrong.

DES source code is *widely* available—on many thousands of computers, especially those with UNIX operation systems. However, though the code is straightforward, the essence of its encryption power is based on lookup tables of numbers that IBM and NSA predefined in the widely distributed source code. It is the design and derivation of those numbers that remain secret—they are the key to evaluating how secure DES is, and judging whether it has the widely rumored, but undiscovered, "back door" for agency surveillance.

Thus, last month's criticism of DES stands: Users have no way to verify that DES offers even limited security without knowing the design principles behind those magic numbers.

Sez they, "We're from the government and IBM. Trust us."

PALATABLE PROMOS

Implementing a realizable fantasy is only half the job; the rest is manufacturing and marketing—work for the "suits." Some suggestions:

Junk mail from Elsevier Advanced Technology uses particularly pleasant—and practical—envelopes. Printed next to the address label is: "Help Us Prevent Waste. We do not want to waste your time, our money, or the world's trees on mailing material not relevant to your interests. If this message is not deliverable or not of interest, please return this envelope and contents to us."

The envelope has check-off boxes identifying several common reasons for such returns, plus lines on which reluctant recipients can identify their interests and suggest others to whom the mail can more properly be directed. *Neat!*

A reader's guerrilla warfare fantasy for those computer-generated phone pitches—a "blue box" that, when activated, reconnects the unwanted incoming call to a 900 number, causing per-minute charges to be billed to the caller through the phone company. Now there's an interesting 900 service the RBOCs could sell to consumers!

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Jim Warren organized and chaired the recent First Conference on Computers, Freedom & Privacy, sponsored by a dozen organizations. He founded InfoWorld, *the DataCast proposal for paperless electronic newspaper, Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS' "Computer Chronicles," founding editor of* Dr. Dobb's Journal, *and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

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A message to inept promoters: On all product packages and in all press releases, prominently state the machine or operating system for which your product is designed. I continue to be amazed at the number of polished packages and promos I receive—that utterly fail to mention what systems they require. *Grrr!*

QUICKIES

A pleasant phone fantasy: How about a phone that self-adjusts its ringing loudness to the ambient noise around it? Thus, it can bleep gently, when one is contemplating one's navel in quiet solitude, and ring raucously when surrounding by blaring rock 'n' roll or TV screeching.

The most feared agency: John Wharton reports a discussion during the Computers, Freedom & Privacy Conference. He was sharing a luncheon table with NSA and FBI representatives...who were expressing their fears about what will happen when the IRS really learns how to use computer surveillance technology.

STANFORD'S SHAME

In 1985, a Stanford computer science lecturer earned the university's Dinkelspiel Award for Outstanding Service to Undergraduate Education. In 1986, he earned the Distinguished Advisor Award of the School of Engineering. For most of a decade, student polls identified him as perhaps the best, most effective undergrad comp sci instructor on campus.

In 1991, he was fired—teaching excellence sacrificed to Stanford's feeding frenzy at the federal pig trough.

Like on-campus, draft card burners opposing war policies, and student sit-ins opposing classified "academic" research, Stuart Reges had publicly opposed a government-mandated university policy. This time, it was Stanford's unenforced anti-drug policy—a hypocritical facade adopted only after federal funds were threatened.

Reges had *alleged* that he did what thousands of Stanford students have done, privately, for decades—possessed and enjoyed prohibited substances on campus. He didn't prove it; he wasn't arrested; he wasn't charged with any crime, much less convicted. But, he didn't have the tenure granted to professorial researchers, and they refused effective protection for his freedom of expression.

Note: A recent *Stanford Observer* carried an article entitled, "Is our teaching that bad?" It concerned possible overemphasis on research—which is usually federally funded.

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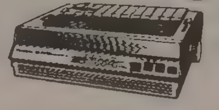

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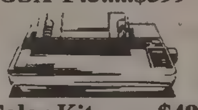

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BUSINESS SOLUTIONS

Traveling WordStar

The WordStar Laptop Collection Is The Latest Entry Into The Market Of Software Designed Specifically For Laptops

BY ED KAHN

With laptops the fastest growing segment of the computer marketplace, it is no wonder that more and more firms are releasing software products designed specifically for laptops. The latest entrant is the WordStar Laptop Collection by WordStar International. This collection has a version of WordStar, once upon a time the leading word processor, abbreviated so it will run on a laptop—even one with two floppy drives and no hard drive.

Several years ago I reviewed a two floppy disk portable and mentioned that I was able to run WordStar. Afterward I received several letters asking how I was able to fit the program on a 720K diskette. There was a small note hidden in a WordStar publication showing which files were essential, thus enabling the program to be configured to run off a single disk.

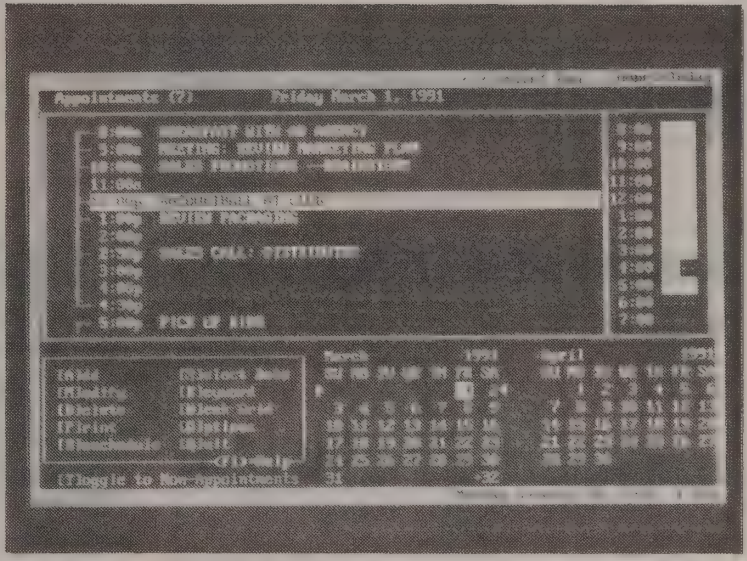
The company has wisely decided to preconfigure the program for those users limited to a two floppy disk system. The company has even included a QuickStart disk to get users up and running quickly. It is unfortunate that this product comes so late, but that seems to be common in the history of the company.

The story of WordStar is interesting, and still one of the mysteries of the modern computer business. When MicroPro, the original name for WordStar International, first released its WordStar program they quickly became the dominant word processor company. Virtually everyone gravitated to the program. And then a funny thing happened. The company, for reasons unknown to me, stopped upgrading the program. Even though users clamored for the innovations that would keep the product competitive, MicroPro responded the same way Henry Ford did when his customers asked for cars to be available in colors other than black. Neither Ford nor MicroPro altered their plans. Gradually the business began to suffer, and in the case of Ford, he responded with a bouquet of colors from which to choose. But MicroPro steadfastly refused to offer upgrades.

Over time, new software products offered modifications and enhancements when used with WordStar. Finally, long after the customers had gravitated to other programs, the company responded with new fully competitive products, albeit too late to keep WordStar at the top of the software sales charts. MicroPro's recalcitrance can be thanked for making WordPerfect and Microsoft Word into such popular programs.

Along with the WordStar Laptop Collection, the company has bundled two other products. They have included an abbreviated version of Traveling Software's LapLink, a utility for easily transferring files between a laptop and a desktop, or for that matter any two computers. I routinely use this program when I get a new computer to review. By simply attaching a cable between the two computers and pressing a few keys, you can transfer files between machines.

The full-featured LapLink offers additional capabilities that I miss in this version. In the full version of the program you can transfer the



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data through either a serial or a parallel port. The parallel is considerably faster, but the serial has the advantage of allowing the program to be cloned onto the second machine. The bundled version that comes with the WordStar collection allows only serial transfers. In addition, although the program is included, in order to make it operational you need a special cable that comes with the full version. By using the enclosed coupon, you can get the cable for $45.

The other program that comes bundled with the collection is On-Time, a calendar and scheduling program. This program is similar to most of the other time scheduling software. On-Time allows you to print calendars for up to nine weeks and arrange schedules throughout the day.

MicroPro has tried to make this the one collection of software that laptop users need by including everything except a database and spreadsheet. WordStar comes with a telecommunications module that will work well enough to get you started. If you have an old copy of WordStar, you can upgrade to this collection for only $89.95. ■

RESOURCES:

Altima NSX ($3,499)
Altima Systems, Inc.
1390 Willow Pass Rd.,
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Concord, CA 94520
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WordStar Laptop Collection ($295)
WordStar International, Inc.
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Novato, CA 94949
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Computer Of The Month

Altima's NSX

When Altima unveiled their first computer a couple of years ago, it generated a lot of favorable press. It was rugged. It was designed for the power user. Though it weighed a lot, it gave a lot. The initial model has been upgraded several times over the last couple of years and is still highly competitive in its market. But now, they have released a notebook computer with a completely new design.

Although the Altima NSX is a bit heavier than many notebook models, it is true to the Altima tradition. It is powered by a 386SX processor running at 16MHz, switchable to 8MHz. It weighs 9.3 lbs. and measures 11" x 14" x 2". It has a 20MB hard drive and a high-density 3.5" floppy drive. It comes standard with 2MB of RAM, expandable to 8MB by the addition of memory cards ($599 for 2MB). You also get a built-in modem-fax card.

The unit is stylishly designed. It looks great. However, I do miss handles: whether a case is included or not, eventually you have to carry the computer. When you open the NSX you see a large LCD. Measuring about 10.5" diagonally, it makes reading text less taxing than some of the smaller notebook models. The backlit screen features a black display on white background. Altima makes it easy should you want to use an external monitor with the NSX. Just plug in the monitor

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and indicate in the setup program to expect the external monitor. Additionally, you can change from an internal to external display through either a DOS command or a function key instruction. If you choose to use an external monitor, it must be either a VGA or multiscan model. There is a 15-pin connector, and the internal graphics will support only these classes of monitors. Software written to the older graphics standards is, of course, still usable as it will display well on either a multisync or VGA monitor.

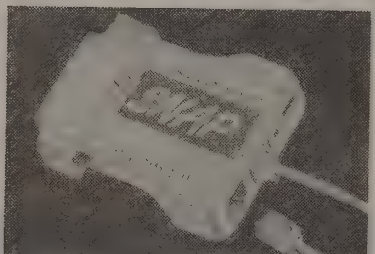
The keyboard is a real pleasure. After working on so many small notebook computers with tiny keyboards, I really appreciate a comfortable one. After all, that is one of the two ways in which you have most of your interaction with the computer. It really is good to have a keyboard that allows you to work at full capacity. Despite my praise for this keyboard, I realize that keyboard taste is rather subjective. And that is one of the reasons Altima includes a port for attaching the keyboard of your choice. I have found that I prefer to keep a favorite keyboard wherever I will most often be using a laptop. I suppose part of the decision when selecting which model to purchase rests in part on whether you will be using this as a primary computer or in connection with a desktop machine. But back to the keyboard. One of the things I don't like is the embedded numeric keypad. Fortunately you can get around this objection with the addition of a numeric keypad ($99).

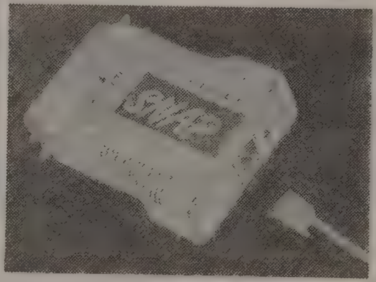
Altima has included an interesting modem. It is 2400 baud and Hayes compatible. In addition, it can send—but not receive—faxes at 4800 baud. While that is half the speed of a standard fax transmission, it is convenient to be able to send a fax from your computer in a pinch. There is one catch in this fax system, however. You must have communications software that handles fax transmissions. The documentation doesn't mention any software, so you will have to search around for the appropriate package. If you need better fax capabilities, there are several small units that will attach to the serial port. These units all have the necessary software. I have also seen press announcements about a product that will allow any computer to send faxes over their existing modems. I will keep my eyes open for this product.

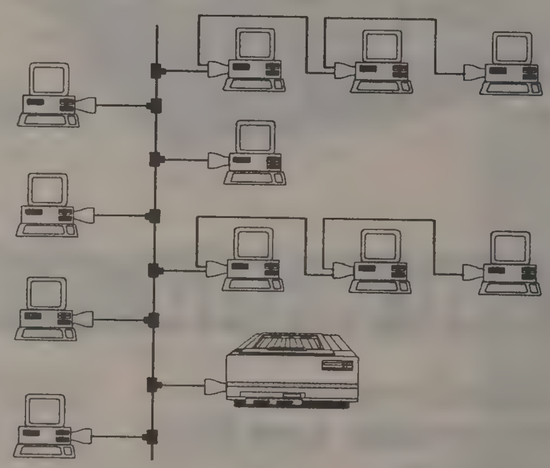
The battery system on the NSX is a mixed bag. On the one hand, the battery pack recharges in less than two hours, but it doesn't last all that long. You can increase the time the battery will power the computer by using standard techniques such as running at the slower speed and turning off the display and hard drive during a period of nonuse. All of these variables are controlled through a setup program that is well documented in the booklet that comes with the computer. The instruction booklet is small, but quite adequate. Although I prefer a concise book to a weighty tome, the quality of this book is beneath that of the machine itself.

There are some options available. A 5.25" disk drive ($299), which attaches through the serial port, makes it easy to transfer older software that you do not have on 3.5" disks yet. A math coprocessor ($449) is available but must be installed by Altima. Extra battery packs are $99.

I have been told Altima will soon offer a 60MB hard disk. Computers that are bought before the larger hard disk is available will be eligible for buying an upgrade. In addition, they will offer the computer with a 20MHz central processor. ■







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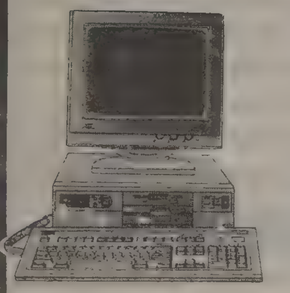

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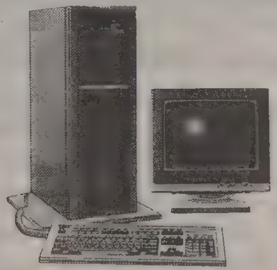

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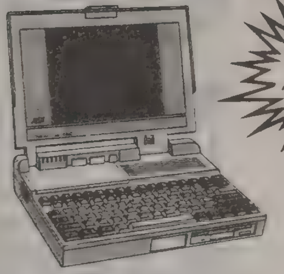

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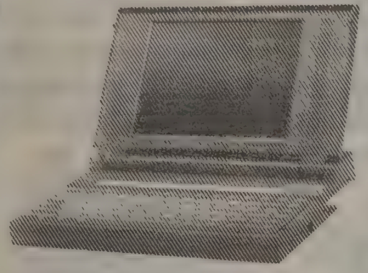

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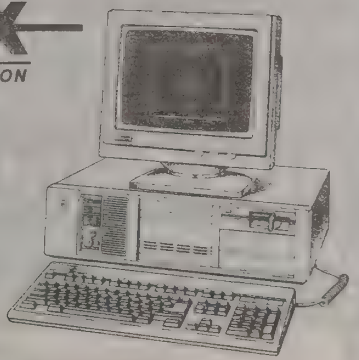

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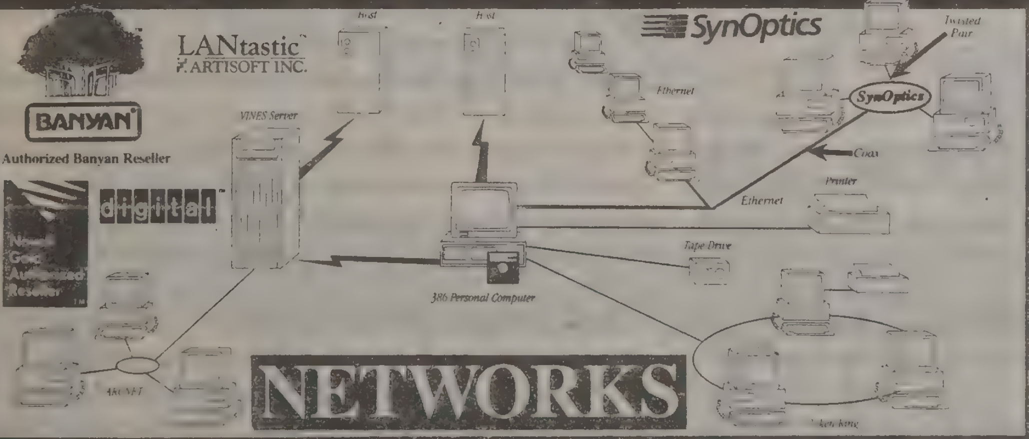

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Getting The Most From An Old Portable

BY PAUL HOFFMAN

The computer industry is famous for forgetting about the "average" user. Both hardware and software companies usually try to follow the leading edge of the technology so that they can get into large corporations with lots of money to throw at problems. This helps keep the industry working on products that work on the latest machines, but tends to leave behind people who bought their computers more that a year or two ago.

> *Although Few Companies Are Targeting The Floppy-Only Portable Market, There's Still Plenty Of Software That Works Well With Those Systems, So You Can Get Many More Years Of Life Out Of What You Have.*

If you own an older portable computer or a current but bottom-of-the-line model, you are probably aware that not many companies are trying to help you out. The one-floppy and two-floppy portables that were the only ones affordable a few years ago are like slow behemoths compared to the hard-disk-equipped portables you can pick up today for around $1,500. For an extra $500, you can get a reasonable no-name portable with an 80386SX chip and a 40MB hard disk.

Not that you want to buy another portable. You want your current portable to work better for you. Although few companies are targeting the floppy-only portable market, there's still plenty of software that works well with those systems, so you can get many more years of life out of what you have. Most of the recent hardware innovations for higher-powered portables work just as well as for older portables.

FITTING IT ALL ON DISK

The two most serious problems for people with floppy-only portables are software that takes up a large amount of disk space and software that accesses disks often. Although you may have thought about these problems when you bought the system, you probably didn't realize how serious they might be until you started to use the computer in earnest.

The diskette space problem is somewhat obvious: two floppies don't hold much in the way of software, especially if you have a lot of files that you need to use on a regular basis. One-floppy systems are even more difficult to set up. Most people try to have one of their two floppies devoted to MS-DOS and programs, and the other to documents. This way you can copy documents to your office system when you get back from using the portable without worrying about the program files. On a one-floppy system, you have to pray that you will have enough space left for documents, or get used to swapping floppies until your wrist breaks.

A simple but often-overlooked method for this is to have multiple MS-DOS disks, each with a different program on it. For example, if you use both a word processor and a telecommunications program, have one bootable diskette with MS-DOS and the word processor, and a different bootable diskette with MS-DOS and the telecommunications program. Of course, both of these disks should have as few of the MS-DOS external files as possible on them.

The second problem, slow diskette access, is more difficult to solve without trying lots of software. Most programs assume that you are running from a hard disk and that they can make extensive use of the hard disk for temporary storage. Since hard disks are very fast, this is usually not a problem. On a portable with slow floppies, it becomes almost unbearable to hear a program go back to the floppies every time you perform some action. For example, Microsoft Word is almost unusable on a floppy-based portable, since it accesses the disk nearly every time you use any formatting.

Programs that were designed for floppy-only systems load the whole program into memory when they start and then only access the disk when they read or write documents. If they can't load all of the program in at once, they load all related parts of the program at one time and only access the disk when you change what you're doing, e.g. when you start to print. Generally, smaller programs are better about intelligent disk access than larger ones.

WORD PROCESSORS

The most common use of portables on the road is word processing. Most portables used by businesspeople are "time expanders": business tools that help turn unproductive hours into working hours. If you're sitting in a hotel room after meeting clients at their offices, you can write up a report using paper and pencil, or you can directly enter it with a portable computer. If you have to take long airplane trips or are forced to sit in airports for hours, having a computer around can let you turn those hours into useful work time.

Most of this type of writing requires very little of a word processor. Popular programs like WordPerfect and Word have dozens of advanced formatting features that are useful for specialized writing but of no value when writing letters or simple reports. Instead of wasting disk space on these features in full-blown word processing packages, you're much better off with a word processor that uses little disk space.

Just because you use one word processor at work, don't assume that you want to use that one in your portable as well. This is particularly true for WordPerfect users. Although WordPerfect can be made to work on a two-floppy system, it is cumbersome. You should strongly consider a smaller word processor that is designed for smaller systems. There are many great shareware word processors

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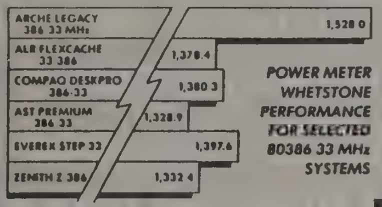

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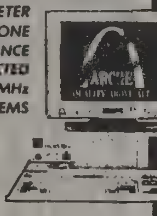

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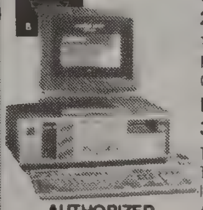

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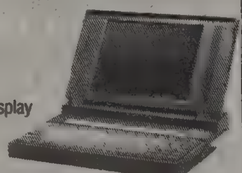

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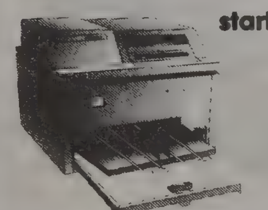

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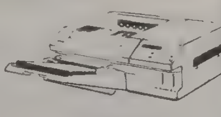

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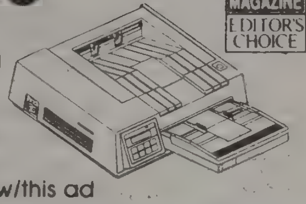

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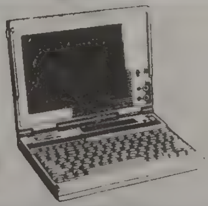

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that work just fine in floppy-only systems, and some companies such as WordStar have pared-down versions of their programs that also work quite well.

TELECOMMUNICATIONS

If you communicate from the road, you want both a small and efficient communications program and a small modem. Newer portables come with modems built into them, but older portables often did not. On some models, most notably Toshiba, you can buy an internal modem as an option, although these internal modems are often significantly more expensive than their external counterparts.

In the past few years, the market for tiny modems has expanded significantly. These "ultra-mini" modems are about the size of two cassettes and plug directly into the serial port on your portable. Although these are often more expensive than full-size modems, they are incredibly more portable. They weigh almost nothing, can usually fit into the portable's carrying case, and do not need a power supply. Some ultra-minis work off of the power from the serial port; others run off tiny batteries that last for months.

If you don't go with an ultra-mini, you can still get a small, lightweight modem very inexpensively. Zoom Technologies, one of the more popular brands, makes most of its modems about the size of a small candy tin, although these require external transformers which are often much heavier than the modem. Other brands are about the same size, but are battery powered and thus much lighter overall.

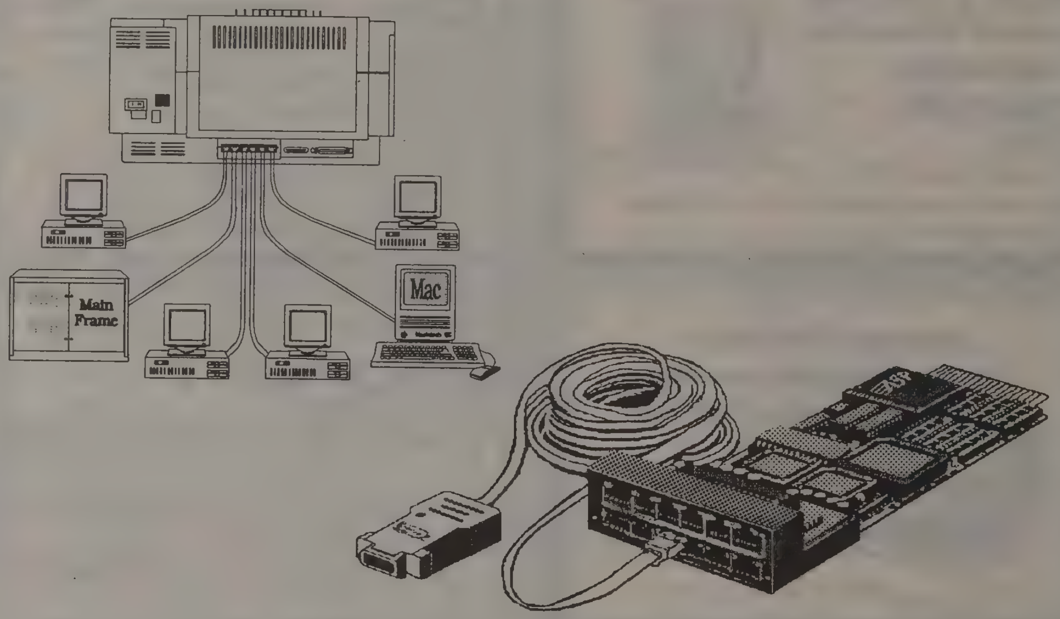
> **Just because you use one word processor at work, don't assume that you want to use that one on your portable as well. This is particularly true for WordPerfect users. Although WordPerfect can be made to work on a two-floppy system, it is cumbersome.**

Unlike word processors, most telecommunications programs are small and do not require much disk access. Even the programs with a wealth of features are not too large and can often be run from a single floppy with lots of room to spare.

Again, shareware programs seem to have the advantage here on size and speed running on floppy-only systems.

Sending files back and forth by modem is handy when you're on the road, but it is often slow. If you carry your portable to the office before and after your trips, you can move files to and from your portable much more easily with dedicated software. One of the most popular packages for this is Lap-Link from Traveling Software. This package makes error-free file transfer easy through

Continued on page 205



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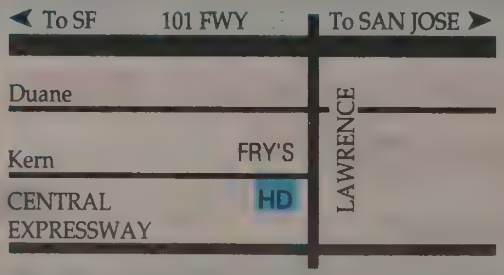
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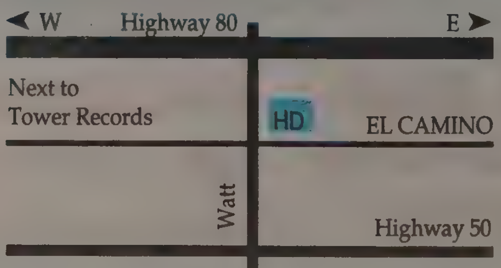
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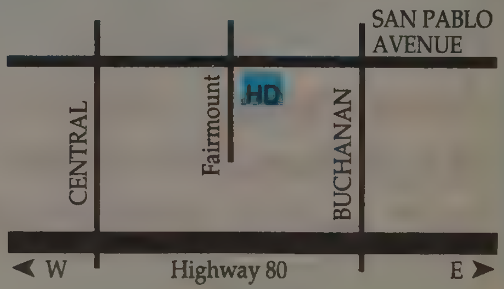
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BY MICHAEL ROBIN

Geographical Information Systems, or simply GIS, enable computer users to capture, edit, view, and manipulate information spatially and geographically, rather than being confined to the traditional rows and columns of databases and spreadsheets. Being able to see information as more than a number, as something tangible and relational, makes it easier and faster to understand.

Over 85% of all databases contain geographical information, such as street addresses, zip codes, or telephone area codes. Using GIS applications to display and analyze this information is a rapidly growing market. Many computer industry analysts agree with Scott McNealy, Sun Microsystems president and CEO, in his observation that GIS has "the potential to be in the 1990s what word processing was to the desktop computing industry in the 1970s."

In January of this year, MapInfo introduced a version of its desktop mapping application for the Sun SPARCstation and HP workstation. Initially released in 1987 for DOS, and later for Windows and the Macintosh, MapInfo is a powerful GIS application that does more than help create maps for your data.

MORE INFORMATION ON A MAP

At the most general level, GIS products combine data and maps. The most effective applications allow users to layer different combinations of data from multiple sources into a single map, summarizing its geographic, cultural, scientific, and other attributes. Examples of GIS maps range from traditional street maps for demographic analysis, land use and ownership patterns, or marketing analysis, to mapping the brain and nervous system.

Maps—showing boundaries, locations, distances, routes, reference points, and landmarks—with their related data provide a powerful way to understand and communicate your ideas. Desktop mapping allows you graphically to manage, analyze, and present your data and view the geographic results. While map making and its related tasks are still performed manually in many cases, the speed, ease of use, and increasing functionality of the desktop computer, particularly workstations, are encouraging many to computerize these tasks.

A recent project of the US Geological Survey, for example, used a multifeature GIS map to locate historic Native American villages in Utah. Common characteristics of known village sites, such as elevation, distance from water, soil types, and trees whose nuts were a dietary staple were specified and overlaid on maps to determine possible sites. Of the possible locations selected with the unique combination of characteristics over a 10,000 square mile radius, 85% had once contained villages.

WHAT CAN YOU DO WITH A MAPINFO?

Since data is at the heart of GIS, you need the ability to work with a variety of databases in your mapping package. And since maps are graphic objects, you also need to be able to perform graphic operations with your databases. MapInfo takes advantage of a graphical user interface. It also features its own powerful relational database engine with SQL capability, making this program a powerful interactive analysis tool. In addition, MapInfo is compatible with most data formats, including dBASE, FoxBASE, Excel, and Lotus, allowing seamless interchange of data between it and other programs. MapInfo treats these files as its own, eliminating the cumbersome process of importing data. MapInfo imports and exports ASCII data as well as AutoCAD compatible .DXF files. You can also use it to create your own databases.

Hot Keys is a MapInfo feature which allows data to be examined and manipulated simultaneously in three modes—maps, graphs, or rows and columns. Multiple views allow for data analysis in the format most natural to the person reading it. Being able to view the same data in different ways makes it easier to identify new relationships among the data. The links between the windows are "live": the changes in one view are reflected automatically and immediately in the other corresponding windows.

Information contained in each of these modes, such as the points on the map or statistics in a graph, are also linked "live" to the database. When you enter a change in the database, the map changes; when you change the map, information in the database changes. You can call up database information for any point on a

Continued on page 206

> **"The mapping itself is a very interesting presentation technique. But MapInfo is of a level above what else is out there in terms of handling the databases, not only within one database but among each other, creating relations."**
>
> **—Robert Briscoe, vp marketing/ business development, EmCare**

Win-Win: Paid Support For Free Software

If Your In-House Wizards Are Spending All Their Time Debugging Printer Drivers, Cygnus Support Has A Better Idea

BY BROCK N. MEEKS

The "corporate credo" is to make money. Companies invest money in technological support to make themselves more competitive by being more efficient and productive. The mission isn't to have the latest whiz-bang technology, it's to operate business better.

Technological support helps people do things better, faster, bigger, or cheaper. According to Cap International, a Massachusetts research firm, no matter how skilled your staff or how minimal your software maintenance requirements, current software and documentation are essential to keeping your system running at peak efficiency. Provided automatically on a regular basis, these updates incorporate technical changes, product improvements, and documentation refinements—all features geared to improving your system's efficiency, performance, and productivity.

Many companies with UNIX-based systems use various programs distributed without charge by the Free Software Foundation. Many others would use them if it weren't for the fact that there hasn't been an equivalent of the technical support offered by commercial vendors, despite the excellence of the software itself.

Enter Palo Alto-based Cygnus Support, with a better idea and a client list that includes the likes of NASA, Intel, and UC Berkeley.

FREE SOFTWARE?

Perhaps a bit of explanation about free software is in order to set the stage. It's the brainchild of the Free Software Foundation in Cambridge, MA, created under what was called the GNU ("GNU's Not UNIX") project. GNU is a reimplementation of UNIX, written from scratch. The underlying premise is that all the source code is free—not just open, free. The GNU Emacs editor, G++ C compiler, and a host of GNU tools are direct descendants.

Other features of free software:

- The code can be compiled on systems that the original writer had no access to, giving it a wider potential audience.
- You can add any features that you desire. If these features are of interest only to you, so be it, you have your own custom version; however, if your changes are of interest to a wider audience, you can easily make your modifications available to the entire UNIX universe (courtesy of the Internet).
- Bugs, an inherent problem in all software, can be found and fixed by anyone. Users can then distribute the fixed versions to anyone else (again, usually via a mailing list on the Internet); this tends to make free software become bug-free much faster than commercial software.

The GNU tools and compilers are revered among UNIX wizards as being faster, more powerful, and more portable than any commercial counterpart.

However, everything that's good about free software is also bad, or at very least, frustrating.

"Here at NASA we have a heterogeneous computing environment that uses the GNU tools throughout a wide range of architectures, ranging from Crays to workstations," says Tom Woodrow, scientific analysis group leader. "That makes for a large user environment" and hence the frustrations.

Woodrow says that it was commonplace at NASA for each project team to be using a different version of the same software. "These guys would fix a bug or create a modification, and spread it among others using that architecture," he says. But go to another platform, and the software becomes unusable. Sometimes even the engineers across the hall couldn't use the program.

ENTER CYGNUS

Michael Tiemann once had the ideal job: being paid to write free software. Now he has a better job: corporations pay his fledgling company, Cygnus Support, for commercial support of free software he initially wrote.

Intel became a customer so they wouldn't have to worry about the integrity of the software or whether or not their programmers and customers were using the latest version.

"We give users access to the type of support they're used to getting for a commercial product," says Tiemann, president of Cygnus. "We give them the best software—free software—in the UNIX environment." Not only does Cygnus provide an unprecedented level of support for free software, the Cygnus staff includes many authors of that software.

For NASA, the inherent "fixability" of free software was the dog chasing its own tail. Woodrow came to Cygnus for the answer. "We wanted software that we could use across all our systems. We wanted everything to look and act the same." Cygnus gave them that capability.

Before Cygnus came along, a company's local UNIX heroes would be called on to maintain the software. Maintaining the software often required a programmer to spend "up to 60% of his time just chasing down the latest bug reports or developing a new feature," Woodrow recalls. And all that time spent working on the tools took the programmer away from what he was hired for in the first place.

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Woodrow says that once NASA learned of the amount of time programmers were spending at tasks other than what they were hired for, a decision had to be made. "We could have done it in house (support the free software)," he says, "but we would have had to do it with more people, and create an entire new department. Cygnus saved us money and time."

CLUTTER CULTURE

Thousands of programmers have their hand in the free software source code pool. That accounts for some fast-evolving code. But as different versions accumulate, source code gets cluttered.

"Each piece of software needs a strong center for maintaining it and looking after it; otherwise it falls apart into several different versions," says John Gilmore, founding member of Cygnus. "Typically, wherever there is a programmer who has put a fair amount of time into working on a piece of software, changes will accumulate into that version. Unless they all get put back into the master copy, you have differences that just don't go away."

To combat this dizzying array of changes, the Free Software Foundation has set up an extensive ad hoc network of program "maintainers" (volunteers who take on the responsibility of insuring that changes and fixes get incorporated into the latest version), administered through the Internet. But, as Woodrow points out, just pulling information from the Net takes a lot of time.

Such a network is fine if the clients "live and breathe this stuff," says Chris Benanati, a contract programmer for Intel's 960 chip solutions project. "But to try and keep up with the changes and do your job at the same time can be insane."

"What we're selling is a service for people who don't live and breathe fixing up free software," Gilmore says. "These are people that just want to use the tools" and get on with their work.

Benanati calls it "leverage." Intel became a customer so they wouldn't have to worry about the integrity of the software or whether or not their programmers and customers were using the latest version.

Intel ships the GNU tools with its 960 chip so that the chip has a dependable programming environment that's common among company engineers and developers alike. "Cygnus could deliver the tools with the speed we needed," says Benanati.

The speed factor isn't one you're going to find with a commercial product, says Benanati. With a commercial program, implementing a new set of features or tools might take a year or more. Cygnus can turn around patches and bug fixes in as little as four hours. "We wanted someone to re-target the tools for customer tools," says Benanati. "If there are good development tools for the chip, then the chip will be successful."

The idea of leverage comes into play when you consider the benefits. "We used Cygnus to leverage our position with the Intel 960 customer base," says Benanati. "When developers see that we have a wide range of tools available, it makes the chip more appealing." (The 960 chip is used as an "embedded system," that is, a self-contained microprocessor that lives in another type of machine—a toaster, or a Chrysler fuel-injection system,

Continued on page 49

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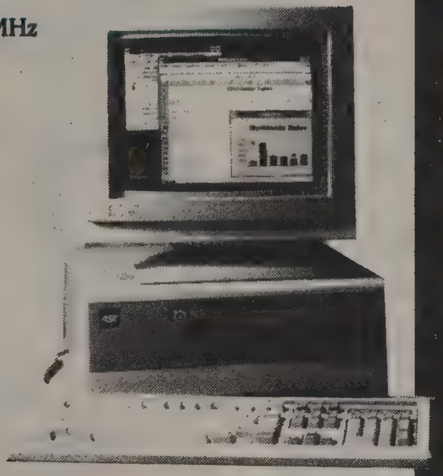

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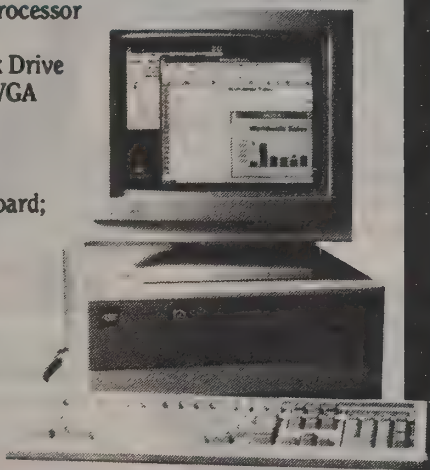

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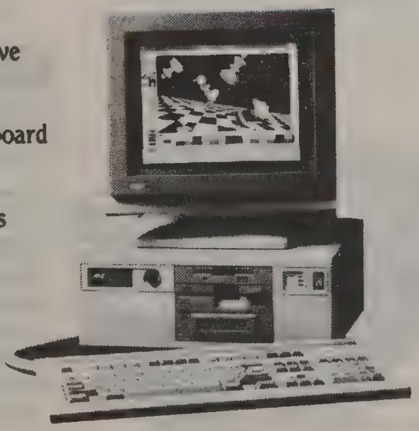

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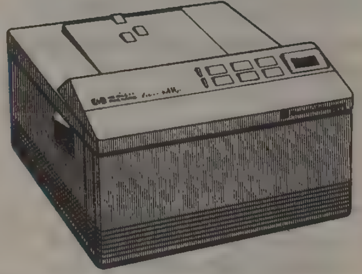

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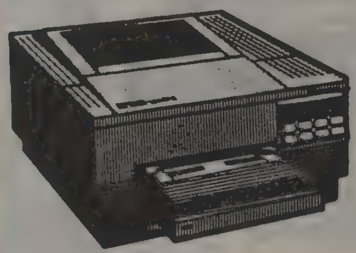

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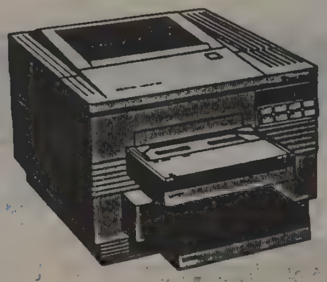

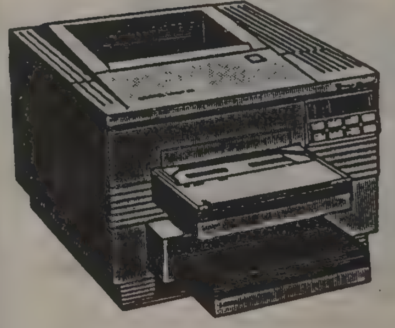

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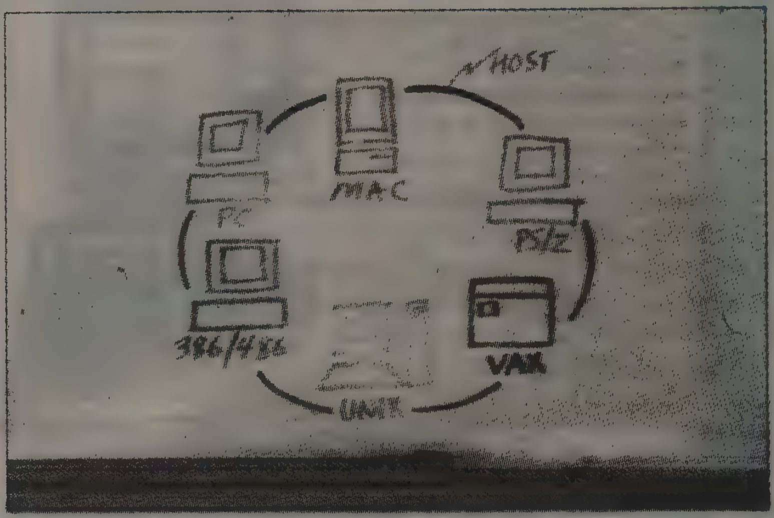

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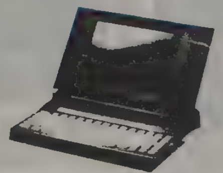

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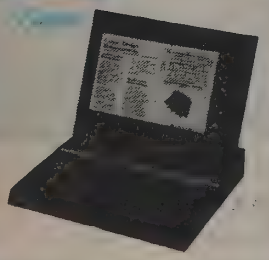

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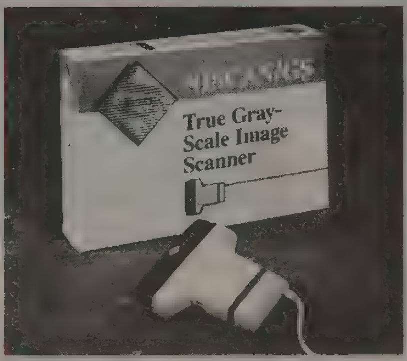

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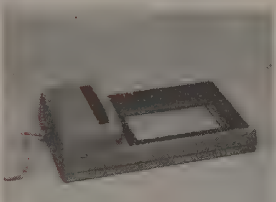

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Catchword $[illegible]
Perceive Personal for DOS $199
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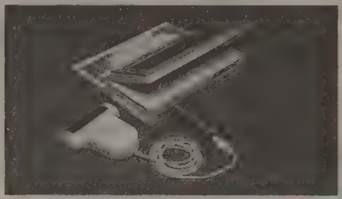

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This special adapter allows you to use your hand scanner with your laptop or home computer without a controller card.

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- Direct output to Dot-Matrix or laser printers

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CAT Reader OCR $59

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- Merges two scans for full page images
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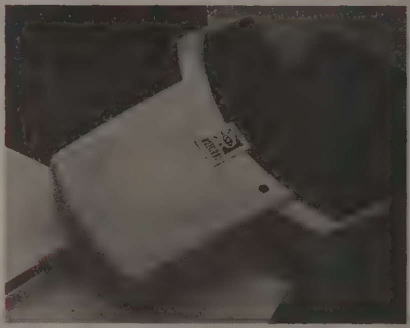

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Continued from page 44

or the fire control system for an M1-Abrams tank).

"The biggest benefit is that [Intel] didn't have to create an in-house department to provide the tools, and they didn't have to pay exorbitant sums of money to have them custom developed," Benanati says. "Again, it goes back to that word 'leverage.'"

THE REAL WORLD: RELIABILITY IS CRUCIAL

At the February Usenix conference, a meeting for UNIX users to augment the exchange of innovative technologies under UNIX, the biggest concern among attendees was finding solutions to "get them through the day." Forget new development; forget application design. System administrators crowded into a standing room only conference hall and bitched about weak device drivers and the limitations of sendmail.

While commercial vendors simply shrugged their shoulders, leaving users to hack their own fixes (and make their own mistakes), the folks from Cygnus circulated the idea of their new company with the quiet confidence of a poker player who's just drawn into a royal flush during a table stakes game.

"It's a quality assurance thing," says Gilmore. "Someone might be designing the world's best word processor, but they could care less about the GNU shell, or the compiler for that matter—they just want it to work." And they want it to work now.

Many companies wanted to contract support for free software to an outside organization that could efficiently take care of problems for all their programmers at one time. Attuned to the traditional mindset, this support would logically fall to the commercial manufacturers of the software. But in the case of free software, such a company didn't exist until Cygnus stepped in to fill the void.

There's no shortage of UNIX wizards who contract themselves out as hired guns. But it is beyond the scope of any one person to have an expertise in all kinds of software. However, in the case of Cygnus, where the staff includes the authors of many of the FSF programs, you have a kind of UNIX braintrust at your beck and call. In this sense, the collective experience of Cygnus programmers becomes the designated hitter of a company's development team.

David Wallace, Cygnus director of support, says that users of proprietary software now have a choice of using free software because it can be fully supported, while at the same time retaining all the benefits that free software has to offer. When discussing the advantages of his company's software support, he runs a list that would make any project manager's light up:

- Delivering software that can be used without royalties;
- Providing quick, full answers to support questions;
- Performing quality assurance on all software shipped to ensure the software meets commercial reliability and security requirements;
- Keeping all users informed of the status and new features for the supported products.

Gilmore says that when a new version of a software prod-

Continued on page 184

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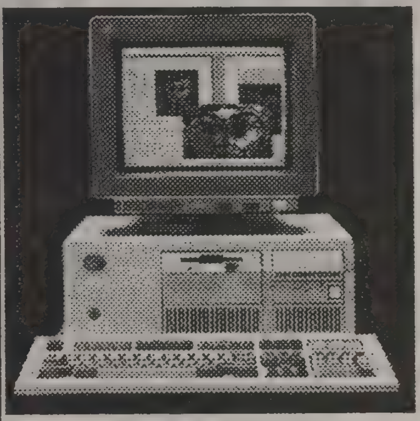

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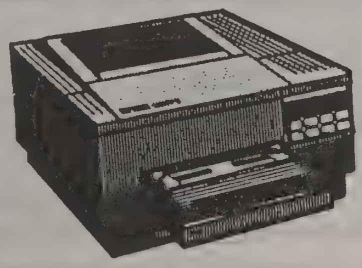

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Building Your Own Server

One Of The Best Ways To Improve Your Price-Performance Ratio

BY WAYNE A. YACCO

Planning to spend $15–20,000 for a LAN server? You might be surprised at what you can put together yourself. Over the next couple of columns I'll describe a top notch server you can build for much less.

More important than the reduction in your initial outlay, though, you'll find that putting together your own server will give you an invaluable familiarity with your hardware. The long-term benefits you'll eventually recover as you provide your own service for common computer complaints will far outweigh the early savings. That's not just the service charges—it's downtime!

MOTHERBOARD

The most important part—the heart—of any computer is its motherboard. For the heart of this machine, I selected a 33MHz Micronics i486-based EISA (extended industry standard architecture) motherboard (standard configuration, list price $2,330; as configured with 4MB RAM, $2,580). Micronics makes one of two or three boards that I've had good luck with since the 80386 appeared, and reliability is the most important criterion for anything serving multiple users. Anything that wouldn't pass muster with the Maytag repairman would be a false economy. Its published statistics aren't bad either.

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Norton SI 4.0:	**53.2**
Landmark v. 1.14:	**145.8MHz**
Power Meter v. 1.3 MIPS:	**14.5**
KWhetstones:	**3010.0**

A Micronics motherboard was also the first I ever used to assemble my own 80386 system from scratch. So, in a way, it's my sentimental favorite too. You might choose another brand, but go for quality. Years ago, when I was still doing end-user consulting, I had the occasional misfortune to support inexpensive systems with cheap offshore boards. It was not unknown for such machines to unexpectedly deposit the user at the command prompt right from the middle of an application. Others might just hang up and crash. (Not all of the offshore boards fall into this category; I use a system built on an old 16MHz DTK '386 motherboard every day, and it's been very reliable.)

Copyright © 1991 by Wayne A. Yacco. All rights reserved. *An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at Box 269, Burbank, CA 91503.*

The Micronics EISA model uses 1MB or 4MB SIMMs for up to 64MB main memory. It comes with 4MB of standard memory, to which I have added four additional 4MB Kingston Technology SIMMs for a total of 20MB.

Memory is the single most important performance factor for the support of multitasking operating systems like OS/2. In fact, at a recent Windows 3.0 technical workshop I attended, Microsoft said that a '286 AT with 3 to 4MB would outperform a '386SX with just a single megabyte. Memory is, happily, also one of the less expensive ways of boosting performance.

This motherboard also comes with 64KB of super-fast external cache that augments the i486's internal 8KB, and lets you use relatively inexpensive 70ns (nanosecond) SIMMs. It can be increased to 128 or 256KB.

There are lots of sources for the standard SIMMs used in this motherboard, but not all machines use them. Kingston makes more varieties of memory modules (for PCs, laptops, and laser printers) than any other company I know. It's a California company too, so support is nearby.

That's a lot of horsepower, and more than I need to serve my small networks, which typically have five to eight workstations attached. However, I have several machines that can perform as servers. So I also wanted a machine that could be used as a rootin', tootin' workstation for desktop publishing, desktop video, multimedia presenta-

Buying extra power now can save an upgrade later. The incremental cost of an i486 over an 80386 may turn out to be cheaper than an upgrade, especially if the upgrade is made in the near future. Plus, a hot motherboard is there to use at peak times right from the beginning. Compare that to the interest on your savings.

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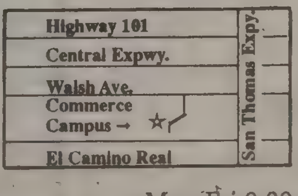

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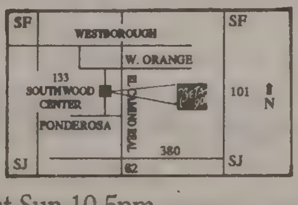

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tions, and other graphics applications. My system reflects those needs.

You'll need to tailor your server's processor, memory, video, and storage requirements according to your own needs. Remember one thing though: Buying extra power now can save an upgrade later. Some manufacturers claim that their semi-passive backplanes are the best way to save on upgrades. Sometimes upgrading a processor board does cost less, but you have to look at the discounted cash flows in each case to be sure. The incremental cost of an i486 over an 80386 may turn out to be cheaper than an upgrade, especially if the upgrade is made in the near future. Plus, a hot motherboard is there to use at peak times right from the beginning. Compare that to the interest on your savings.

You should also consider EISA vs. MCA (IBM's micro channel architecture) vs. ISA (the AT's industry standard architecture). EISA and MCA both support bus mastering, which lets coprocessors share their bus intelligently. ISA doesn't. If you use smart disk-caching controllers and bus-mastering network cards, you can get increased throughput from EISA or MCA. ISA systems sometimes perform better than comparable EISA systems using standard ISA cards. Micronics and other vendors offer both EISA and ISA boards. I don't know where you can get an MCA motherboard to build your own system—though they may be out there.

CASE STUDY

The box you stuff your server into can easily get overlooked; many will fit. However, last year at COMDEX, I saw one that absolutely blew me away.

Songtech International's server-sized case represents the best workmanship I've seen come from Taiwan. Panels and doors are heavy gauge steel that fit together like a Chinese puzzle box. Other marks of quality include a real cylindrical door lock (not one of those any-key-will-do jobs), plenty of lights and switches, and a fine finish.

At $425, the SE-AT-29A is about the size of many of the server-style cases on the market, maybe a couple of inches deeper. On the inside, it's the size of a small refrigerator. It's got enough room for an array of six full-height drives, and a twelve-pack of your favorite brew. Even with a floppy drive and tape unit installed, you can stuff 6GB into it without crushing the tomatoes in the crisper. (OK, it's not really a crisper, just a cage for the motherboard.)

Half the drive bays are accessible behind a steel door; the others are behind a panel that only opens with a screwdriver. The top also opens with a screwdriver to provide access to eight expansion slots and several knockouts for extra connectors. (This feature makes it difficult for anyone to casually remove a cable from your server.)

Inside the case there's a three hundred-watt power supply with enough juice to really crank up all those drives. There's also an extra pair of exhaust fans to supplement the one in the power supply. It's a wonderful design and my first choice for any system that needs lots of room for peripherals and the power to run them.

Next month I'll continue with considerations for storage and video systems. ■

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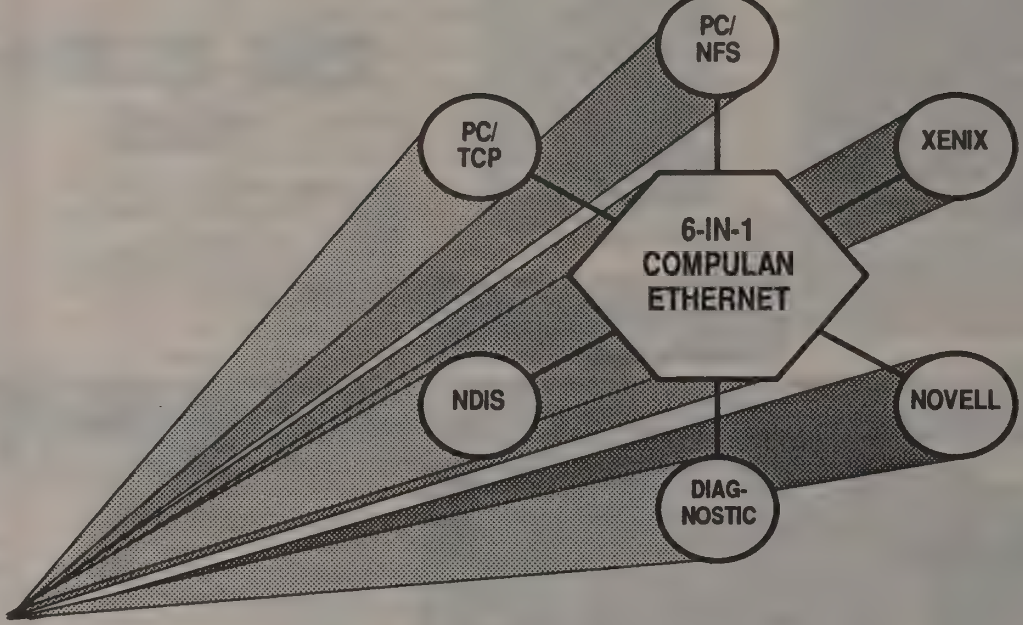

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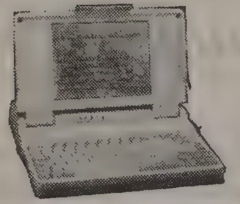

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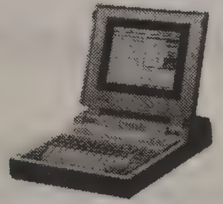

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Power Meter	2.4 MIPS	5 MIPS	6 MIPS	8MIPS	10MIPS
System Price	$~~1049~~	$~~1249~~	$~~1349~~	$~~1399~~	$~~1499~~

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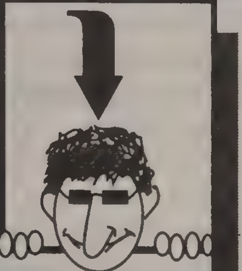

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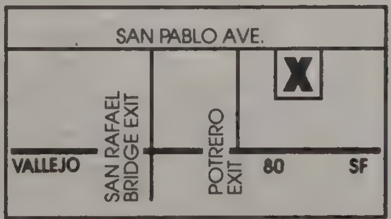

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How To Make Money With UNIX

Advice From An Unlikely Source On How UNIX Helps Your Business Save Big Bucks

BY BENNETT FALK

Last Saturday I spent some time behind a counter in a church basement, scooping up servings of zucchini for a long line of hungry people who dropped by for a free meal. Just about everyone in line was poor; some had no homes; some had no teeth; some were crazy.

After everyone had been served and people were leaving, I noticed a man in a plaid wool jacket and a baseball cap sitting at the table in front of me with his head resting on the table. Another group of diners on the way out looked at him, made a tentative move in his direction, and then continued on toward me.

"He's just asleep, I think," one ventured.

"He's a narcoleptic," said another who turned to me to ask, "Do you know if it's safe to wake up a narcoleptic?"

"Ahh, don't worry. He's like this all the time. He'll be okay," said a third without conviction. They continued past me and left.

I shook his shoulder gently three times before he moved. Without opening his eyes he mumbled, "Who wants to know what?"

"Nobody wants to know anything. I just have to tell you that the meal is winding down. It's time to go."

He still did not move his head, but his eyes opened wide.

UNIX

"I am the Hemispherical Emperor, the Chief Computer Capitalist, the original Venture Vulture. Wherever I go, money happens, cash flows like sap, and one hand washes the other in the time-honored way.

"Now you look like somebody who could use a favor or two or maybe even a friend in a high place. Don't be shy. I have piles of cash. You see," he winked broadly, the side of his head still resting on the table, "I know how money is made."

"Oh?"

"Oh, yes, oh, most certainly yes. Look here, you got a job?" I nodded.

"In the computer industry, I presume?" I nodded again. He sat up straight and brushed a bit of macaroni and cheese away from the corner of his mouth.

"Well, there's a couple of things you have to know about computers. One is that custom application software—database programs and the like—is expensive and takes a long time to develop.

"I'm not talking about your off-the-shelf word processors and spreadsheets and such. I'm talking about the software that's unique to your business, the stuff you really *need* to make your business work. The reason software is expensive is that you have to have people around to write it and maintain it. Not just any people, but smart people, people that know about software and about your business as well.

"The expense of developing new software is a powerful incentive to keep old programs in operation as long as possible. You don't want to have to redesign everything just because your department expanded and you've now got twice as many users.

"Extending the life of your existing software and trying to hold down the cost of software maintenance is what we in the trade call 'protecting your software investment.'

"And what you're protecting your investment from is 'change.' It is a more or less fundamental law that your business software is going to be so expensive that you'd have to be crazy not to protect your software investment. You with me so far?"

"I suppose." From the other end of the basement there was the noise of folding chairs being stacked on tables. Someone was beginning to sweep the floor.

"Another thing you need to know is that computer hardware is always changing. No matter what kind of computer you buy today, in twelve to fifteen months, there will be new computers out that will be faster and cheaper than yours. This pretty much assures that software will continue to be more costly than hardware, and consequently protecting your software investment will continue to be important.

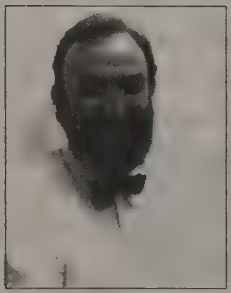
"Of course, changes in hardware may mean that existing software has to be adapted to run on the new hardware, so your hardware investment is one of the things you have to protect your software investment from.

"About the only time computer decisions are driven by hardware choices is at the very outset, when you buy your first computer, and when you figure out a way to cut your hardware costs dramatically, by as much as an order of magnitude.

"There's been a lot of that going around as people discover they can do the same work on a microcomputer that used to be done on a minicomputer or a mainframe. If the cost of the hardware can be cut 90%, the savings can be invested in writing new software or moving the old software to the new computer."

All around us, chairs were being stacked on tables. The people sweeping the floor were getting closer.

> **"Computer hardware is always changing. No matter what kind of computer you buy today, in twelve to fifteen months, there will be new computers out that will be faster and cheaper than yours."**



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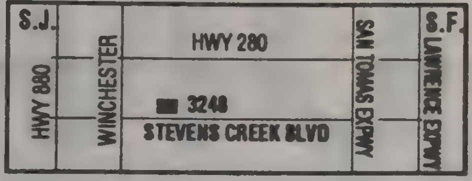

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The Hemispherical Emperor took off his baseball cap and rubbed his fingers through his hair. "Now most business people overlook operating system considerations when they sit down to choose hardware and software for a major project. And why the heck not? Most operating systems are specific to a certain kind of hardware. DOS only comes on the IBM PC family and its clones, the Macintosh OS only comes on Macintoshes, and DEC's VMS only comes on VAXes. An operating system, after all, is just an operating system." He tilted his head back, looked at the ceiling, and closed his eyes. He exhaled extravagantly. Finally, he continued:

"But it does make a difference, you see, because a really durable operating system can reduce the cost of maintaining old applications. This is why UNIX is so attractive. Forget all that stuff about whether it's hard to use or takes a long time to learn. The command you use to see a directory listing (whether it's 'dir' or 'ls' or a mouse click on a folder), doesn't amount to a hill of beans in the grand scheme of things.

"What does matter is that once you've got a working system, you can keep it working even if the hardware changes or the user population doubles, and UNIX offers some powerful advantages here.

"First off, it has a standard programming environment that is pretty much the same regardless of what version of UNIX you're using. So when you do have to do software maintenance, you won't have to relearn everything or hire a whole new staff just to fix up your old software.

"Beyond that, UNIX is pretty good at keeping up with incremental changes in hardware configuration. Once new hardware has been added to the system, it's a relatively simple thing to make these changes known to UNIX. Once UNIX is reconfigured, the changed configuration will be available to application software with no further changes."

At the other end of the basement, they'd started mopping the floor.

"Above all, UNIX is 'portable.' By which I do not mean that it has a handle on it. The point here is that UNIX has been moved to all sorts of different computers. This is important because the software that runs under UNIX inherits some of that portability. If your programs compile and run under UNIX on one computer, chances are they will compile and run under the same version of UNIX on a completely different computer without your having to spend a lot of time and effort modifying the source code.

"That, in a nutshell, is how money is made with UNIX. You build your application and do your business in the normal way, but you hold down the cost of software maintenance by building the application for the operating system. Changing the hardware or the user population gets handled by the operating system, without your having to recode the application itself. Any questions?"

"Uh, no." There were people trying to mop the floor all around us.

"Well, good. Now, of course, you realize that advice like this doesn't come for free, not that I myself am interested in actual remuneration, however, I would like you to think long and hard about change. We do everything we can to insulate software from the effects of change, but we cannot afford as human beings to hold change at arm's length.

"In your case, I think you should begin to embrace change by wearing a tie to work on Monday morning. It wouldn't hurt to show a little class.

"Now if you'll excuse me, I've got to run." The Emperor of the Hemisphere stood up and wobbled toward the door. At the base of the stairs, he called out over his shoulder, "Time really is money, you know." ■

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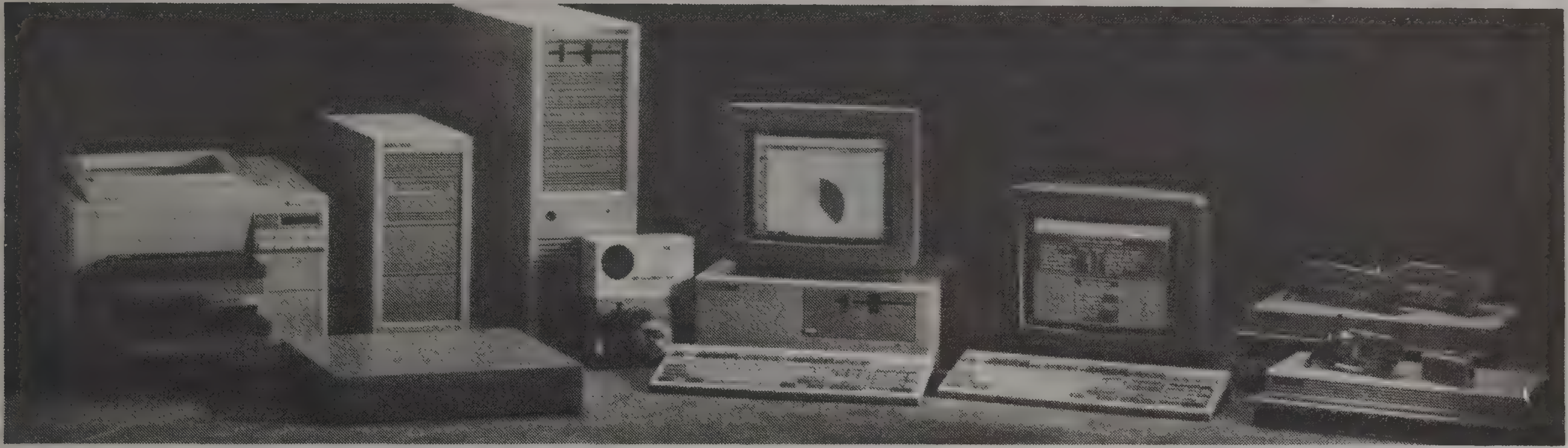

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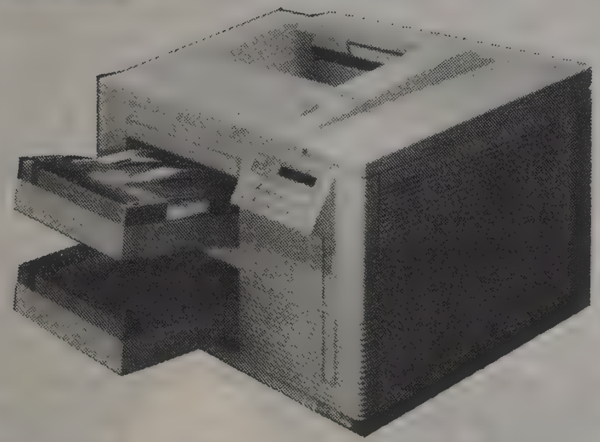

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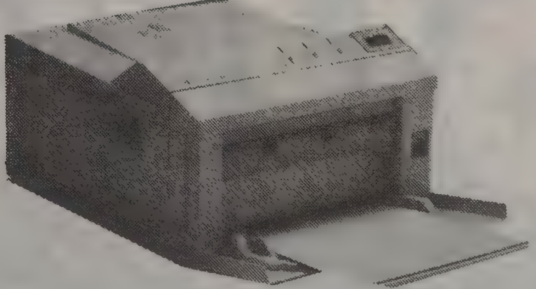

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DESQview Ope Window Into U

Quarterdeck President Therese Myers On DESQview X, Emerging Standards, And The World's Most Fanatical User Base

By Mary Eisenhart
Photos: Ann Summa

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NIX

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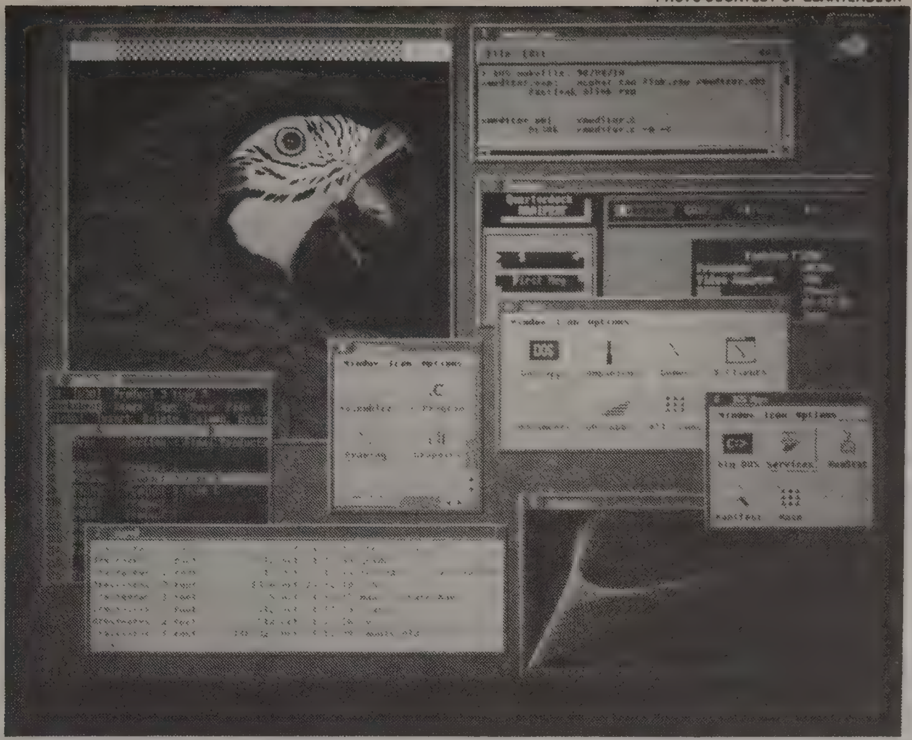

Quarterdeck's DESQview X allows PC users and UNIX X Windows users to access each other's applications over a network.

Founded a decade ago, Quarterdeck Office Systems has always been something of an underdog, competing against the standard-bearing likes of IBM and Microsoft. It has survived and prospered by appealing to independent-minded customers who want the best features and performance offered by new operating environments like Windows and OS/2—and who have a positive allergy to spending money.

"Our view of who we are in the world of computing is that we'll give you the ability to always use your old stuff in ways that everybody is talking about for the new," says president Therese Myers. So while Microsoft proclaims Windows 3 as the operating environment of the future—an operating environment that requires new versions of the applications and fast, powerful hardware—diehard DESQview users are happily running a multitasking, windowing environment that supports their existing DOS programs and even runs Windows 3 as an application.

For years now, DESQview and a host of ancillary memory management products have helped the PC user squeeze the maximum of performance from less-than-state-of-the-art hardware and software. Quarterdeck has attracted a fanatically dedicated pool of users and developers—consultants who put together custom office systems based on off-the-shelf applications, companies reluctant to trash their existing hardware and software investment, and individuals dissatisfied with settling for boilerplate "solutions."

The strategy has clearly worked well for Quarterdeck, which recently expanded its Santa Monica headquarters into a spiffy new building overlooking the ocean and is in the process of its first public stock offering. It retains its grassroots orientation, sending representatives to dozens of trade shows and user group meetings yearly. It's recently opened several European offices, and (thanks to a sophisticated phone system) offers twenty-four-hour global product support ("So," says Myers, "if you call here in the middle of the night, you'll get a tech support person with an Irish brogue").

Not resting on its laurels, it's also pushed its resource-maximizing philosophy even further with DESQview X, a new version of the flagship product that makes the world of UNIX workstations accessible to the PC user. The idea being a variation on the traditional DESQview theme: gain access to the advantages of new platforms and capabilities while continuing to use the existing tools that work for you. (We'll be covering the DESQview X product in a future issue.)

Our first Quarterdeck story (July 1988, issue #43) found the company unperturbed by the advent of Windows and OS/2. When we visited the new office recently, Myers gave us a preview of the X product and a view of the company's plans to build on its current success.

Since you're offering an alternative to Windows, and one that doesn't require special versions of applications, in some circles you're seen as this tremendous thorn in Bill Gates's side...

[*laughs*] Well, we try to be.

It was our vision from the start, and we were very strong in it—we did not believe that people had to buy new things all the time, that things had to evolve.

Planned obsolescence was not part of your strategy.

It was not what we believed.

And we were little. So we believed that our software had to be able to let you use your current investment. What we have seen is unbelievable. You see the systems that are being built around DESQview, and they're all being built around either 286es or 386es.

There's a doctor in Texas who's done a nuclear medicine system—you can see your heart beating on one high-resolution monitor, and there's just a regular VGA monitor over here. He got an idea for being able to hook the cardiogram machine onto it and be able to display it and diagnose. He formed a company with two or three programmers who developed this around DESQview, and they are so far ahead, because of the kinds of tools they work with—BTRIEVE, and Novell NetWare, and a lot of standard programs.

It's just amazing what they've done. It was a combination of being able to get into the system and make do with a lot of parts that were already existing, and put it together, and be able to solve a problem in a very expedient way.

That's what we appeal to. What Bill Gates is appealing to—he has a vision of what a world should look like. And forget all the old stuff, because that stuff's not pure.

The world's never pure. The world's never going to be perfect. What you should be trying to do is give people competitive advantages quickly. What he's asking is to start all over, to have all new things.

It's like the car manufacturers used to be—"Oh, you're going to throw it out in two years anyway."

> *"With DESQview X, when you're connected to networks, you're able to mix and match hardware platforms and operating platforms. We're bringing DOS into this so that on your PC, you can use a program that's running on a Sun."*

That's right, and then the Japanese came in and said, "Oh, no, you're not. You're going to keep it for ten years." And that's who we are. My feeling is there are many, many opportunities associated with that view of the world.

We have a lot of users who have just used the macros, and menuing capabilities, to just customize things and put them together. I would say quite a few people are not programmers.

One of the people we've worked with for years is a consultant who puts together systems. He put one together for William F. Buckley—all old kinds of software that was whatever William F. Buckley knew. He just molded it together, and he never programmed anything, yet he has a full business around developing DESQview solutions. There's quite a few people like that.

But the answer is not to do it for DESQview solutions, the answer is to make do with what's out there and build on it, and get things to the market quickly.

Microsoft believes that everybody has to change for them. And a smaller company has to believe "Let's listen. There's ten people who find a problem, let's try to solve this problem."

Users are so valuable to listen to. I think most of our product ideas are results of trying to solve user problems. We have a product called Manifest that just reports memory—that was a result of people trying to understand memory, trying to figure out what was there, and us being on the phone twenty minutes or half an hour trying to walk them through. We're always grasping for tools that will assist users, to make them more independent. Because a lot of these issues are horrendous.

As I understand it, one of the big strengths of DESQview is that your vanilla applications run nice and smoothly under it. How do you make that happen? Do you work closely with the application developers?

Well, we're lucky now, because we get prereleases. But that's not always the case.

And that wasn't the case in the early days. People just wouldn't fix their things for us. Lotus was not going to look to see if they were compatible with us. So we developed the philosophy early on that we would have to be compatible with the other software. If that meant we had to do all these tricks—the programmers say that they've got all these little checks in there that heuristically decide.... And I say, "Oh God, whatever you say..."

We're focused on being compatible with the software. Where Microsoft would say, "Oh, they're doing something that's against the rules, and therefore it's their problem it doesn't work," what we'll say is, "Oh, gee, it doesn't work. Let's see if we can recognize that case and try to figure out how to make it work"

That's what we've done, and that's why it works, because of the attitude that we'll adapt to the program. Because our view is, we're trying to run with as much stuff as possible—our users should be able to pick whatever they want and run it. We should put no restrictions on what they want to do with it, other than the limit that if it's so misbehaved you can't do it. You just have to shrug your shoulders and say, "We tried."

We will try to make it work, and that has given us our success. We don't know what programs people wrote on their own. There's a lot of shareware out there, there's a lot of programs that were written within a company, and packaged goods are just a small percentage of that. What we're trying to do is accommodate whatever's out there.

There's a company I've talked to that does automated call attendant kinds of things on DESQview. I asked "Why'd you pick us?" "Well, because we tried everything else and yours worked."

We hear a lot lately about user-friendly windowing interfaces like GeoWorks and Tandy's DeskMate that run on low-end PCs. How would you contrast your market with those users?

Our users are more computer aware. They could be putting together a system for someone who's computer illiterate. In each case, the person who's dealing with the computer is saying, "These are the programs I like. There's Paradox and WordPerfect. We need to communicate. We're on a network. We need to have mail." So they're putting together standards with pre-chosen applications, and then they get them to play together, get them to get the most utilization out of their PC. They're fairly sophisticated.

Whereas, I think GeoWorks and DeskMate are more targeted to the newer user. Their applications were built for it.

The developers have to write special versions.

Right, and it's sort of prepackaged. You're buying it because it's going to be easy to use. This is for the new user who doesn't know anything about DOS and just wants a painless intro.

> *"Bill Gates has a vision of what a world should look like. Forget all the old stuff, because that stuff's not pure. But the world's never pure. The world's never going to be perfect. What you should be trying to do is give people competitive advantages quickly. What he's asking is to start all over, to have all new things."*

A large majority of our users are running on networks. A large majority of our users are connected to mainframes. There's a vast number of bulletin boards being run by DESQview. That means that somebody who's very sophisticated knows what applications they want, and puts the shell around it.

For the last few years the computer industry seems to have been very oriented around everyone wanting to sell machines to the MIS director of the Fortune 500 company.

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industry was getting ignored in the process.

Well, we haven't forgotten. We're very, very grassrootsy.

It's not that we don't target the MIS directors, and we don't find them valuable—quite the contrary, we do. But they are the last to accept the product. They are the gatekeepers.

But they're influenced by the hobbyists, the people who go to the West Coast Computer Faire, people who are the independent thinkers, almost the iconoclasts, who say, "Okay, what do I *need?* What are my *needs?"* Those are the ones specifying their needs today to us, and giving us the ideas for where our products go.

So I think that the industry is trying to go to the MIS directors because they send 90% of the business, but the ones who influence within every organization are the people who have been in the computer industry since it started. They've progressed with us through the memory boards to the 386es, they've experimented with the Borland languages, they're the ones that are doing all the object-oriented development tools.

They're certainly PC aware within the job; the one that you go to and ask, "Well, what do you think about this, Joe?" That person is picking the ideas as to where to go, the one that's experimenting with the different connections. He's the one that's running the bulletin boards. He's the one that's putting together two or three different products and making them do, and building solutions put together. Within an organization he's probably a technical person. He has the computer, he buys a clone, he buys the cheaper software, he takes advantage of the tools, and he's doing great things.

So you consider that your user base is independent and innovative, and also fairly technically sophisticated.

I do. But they were also the ones that, because of their interest in computers, have done quite a bit for the computer industry. They were the first to take the time to understand memory, which is important. They are also the experts now, selling services on how to maximize the best of memory. And they should be. It's one of the things that they could take advantage of.

One of the directions we're getting into with DESQview X is, again, what our belief was in 1985—to let the people take the most advantage of their hardware and software. Get it to do everything that is advertised by IBM for OS/2 and all the new applications.

What advantages does DESQview X offer?

Well, when you're connected to networks, there's an ability, with the X Windows system, to mix and match hardware platforms and operating platforms. You can have a Sun workstation and an Apple A/UX machine and an IBM RS6000. They can all be different hardware, except applications can be used across the platforms.

X is a graphics standard?

Yes, and it allows remote graphics. We're bringing DOS into this so you can have mixed platforms. On your PC, you can use a program that's running on a Sun. DOS users with their DOS PCs are going to be able to apply it for the next five or ten years.

That's what the message is—there's a whole lot they should learn, a whole lot they should be aware of, as far as tools and networking. It's going to take them to whole new capabilities.

Does this mean you're going to expand into UNIX-based products?

No. We're DOS-based. We will always try to enhance or expand the capabilities of the DOS user. Our view is to see that they can take the same strides and take advantage of the same kinds of applications that are written, or uses of the networking that all the workstations can use.

> *"We believed that our software had to be able to let you use your current investment. What we have seen is unbelievable. You see the systems that are being built around DESQview, and they're all being built around either 286es or 386es."*

Our strategic direction is only to be able to let DOS PCs play with UNIX PCs.

Since X applications are running under UNIX, how does that work?

Two ways. We've taken the entire X Windows system and ported it to DOS. That means developers can now write X Windows programs specifically for DOS. That's one thing. It means that a port from someone who has an application in UNIX and wants to port it to DOS—it's a matter of weeks in order to port it down.

Vice versa, you could be a DOS user, experiment with a very inexpensive set of development tools—familiar, in Microsoft C, DOS tools, that will open an X Windows program. Lo and behold, it can be ported very easily, in a matter of weeks, to UNIX.

We've been working with a company called XVT in Colorado. They make what's called a virtual toolkit—you design for our set of tools for DESQview X, and we also have toolkits for the Apple Mac, for OS/2, for Windows, for OSF Motif, and for UNIX. We recompile your program, and it'll run on the Mac. It can run under Windows.

So if you're a small developer, somebody who likes to experiment with an idea, and you want to get into a very inexpensive platform—you have your PC, you get the XVT toolkit, and you have the whole

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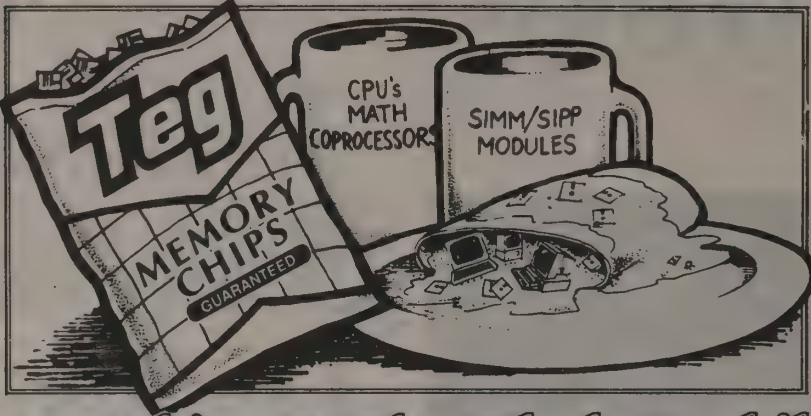

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world available to you after you've done this on DOS. You'll be ahead of everybody because of the access you have to all the tools. That's the kind of tools we try to give to the PC world.

So the object of this is that in a mixed-platform environment, or over a network or whatever, you can keep all your DOS stuff, but not be limited by the limitations of DOS, and you can expand into other worlds.

Yes. Our view is that here's a DOS user with a DOS PC. They've got their habits of what programs they have, and now there's another program that's written specifically and works better on a Sun, or works better on an IBM RS6000. They're only going to be using that one program, but they want to be able to take advantage of it.

Or you've got a Silicon Graphics machine doing 3D modeling, but you want to keep doing letters on your PC.

What this allows you to do is buy the Silicon Graphics, or buy the Sun, and add it to your organization, run it on a network, and let your DOS users run the Sun application, and let the Sun workstation people or the Silicon Graphics users use the DOS application. So you can transition, and buy as you go, without having to say, "I'm going to have to throw away all the DOS things, and I'm going to have to buy new software."

The user should be able to transition, to hold onto their investment, and make their investment work for them. Our view of who we are in the world of computing is just that—we'll give you the ability to always use your old stuff in ways that everybody is talking about for the new.

So DESQview X is interesting because it lets you use your PC. If you're on a Novell network, you have the ability to just add a 386 or 486 box, put some applications on that, and be able to run some of the applications on the 486.

Wayne Ratliff [original author of dBASE], when we first showed it to him, said, "Oh, that's fantastic! I'll be able to do a compile over here, here, here, and here! I can put four systems together and see them all, and they're not going to decrease the processor time!" And I said, "Well, that's an interesting way of doing it..." Here we were thinking you wouldn't have to spend as much money and you could run the thing over the network and put lots of memory in one machine and not as much in other machines. And he said, "No, for a developer, you'd get instant speed."

You're able to do distributed processing, you're able to run the programs most suited for the machine you have. So you can have a program that needs to have a fast processor—run it on the fast processor and look at it. Or you have a user who has a 286 machine, who sometimes looks at a database, who doesn't have a whole lot of memory and doesn't have a whole lot of disk space—they can now be on a network and tie it up and use the program when they need it, and continue their DOS work.

Again, we're in that stage of saying that you're going to go and buy the hardware that's best suited to the applications, and we want you to be able to do that. That does not mean, though, that when you make that buy decision that you've got to scrap everything. That's the root of the idea for this.

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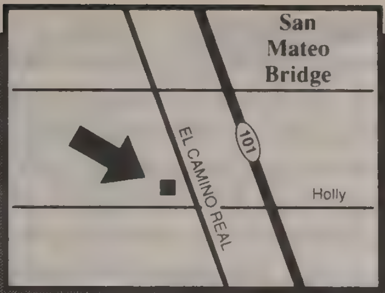

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The X Windows system is wonderfully powerful. It was designed by the X Consortium—IBM, Hewlett-Packard, Apple, Apollo, Adobe, and others—all these companies were a part of it, they were there to be able to let people mix and match hardware environments and work across these computing environments. They did a wonderful thing for the industry, because you can run graphics programs on one PC where there's a lot of computing power, and see it somewhere else. Or to run character-based programs, it doesn't have to be graphics. It just gave enormous flexibility to PC computing. It gives the distributed processing capabilities to the end user.

We've brought over the entire X Windows system to DOS. That means all of the toolkits, the window managers, all the development tools somebody would want to develop a program. We went so far as to say we won't stop with the X Windows system—there's a group called the Open Software Foundation that has their own set of toolkits, their own look and feel, and we said, "Oh, okay, people might want to use that..."

So you support X and OSF Motif?

And Open Look. We support whatever popular look and feel and toolkits are available, we support them all and have ported it over.

But what it also means is that as these X Consortium members add things to the X Windows system they'll become available—they've been working with multimedia, they've been working in the area of PostScript. All those things that have been developed for UNIX now come to the DOS user via DESQview X, so DOS users get to participate in all these new developments that are donated by all these hardware and software companies.

Is there much activity among developers porting UNIX X applications to DOS? Do you think more of that's likely to happen?

I do, because if there's an easy way to get a program out and the development tools are quick, then a whole new world opens up to them. Especially when there's 386es and 486es, so they can look at 386es and 486es and UNIX workstations, and say "Gee, it's the same development effort to do that." Interleaf has been porting the Interleaf product [an industrial-strength publishing package]—they've got a new version coming out, and they're porting it to DESQview X for DOS, because they see that it gives them the whole DOS market. They just see the advantage of the 386es and 486es.

The 386es and 486es with 8514s and SuperVGAs are very powerful. There's a lot of them out there. It's a nice platform to run a graphics program with—the speed's fine for graphics, the displays are getting beautiful. The 386 and 486 PC is not something you can just ignore if you're looking for a market for your products.

What sort of applications do you see this platform attracting?

Well, the people we've been working with right now—there's a lot of CAD people, a lot of process control people. A lot of financial trading—it seems that Sun has done quite a lot of work with software developers. There's quite a few Sun machines in the Wall Street area, and so there's a lot of financial analysis and trading kinds of programs that people are interested in bringing to DOS. There's a company that does factory automation software that's porting it to DOS.

The kind of people we find are the ones targeting vertical applications. The UNIX world has been that way. It's those kind of people; they just see an expanding of where their market is.

And by the same token, people who have mostly been running Lotus and WordPerfect have a new universe opened to them.

That's right.

And they don't have to throw out all their old hardware and retrain all the people who know how to use WordPerfect just fine.

Just train them on the new application. And, at some point, when all the new applications are being run on a MIPS machine, well, the next machine they buy all over the place will be a MIPS machine. But Mary over here is just doing WordPerfect and occasionally using this UNIX application; well, she stays with DOS.

So you can really control what your expenditures are. You don't have to scrap. That's the purpose of DESQview X.

It's neat that DOS has been so powerful and so extensible and so easily adaptable to all the things you want. So much of the industry pooh-poohs DOS—"It can't do this, you have to go to a whole new operating system." But it's just amazing what DOS can do. It's a wonderful building block. (Quarterdeck Office Sustems, 213/392-9851) ■

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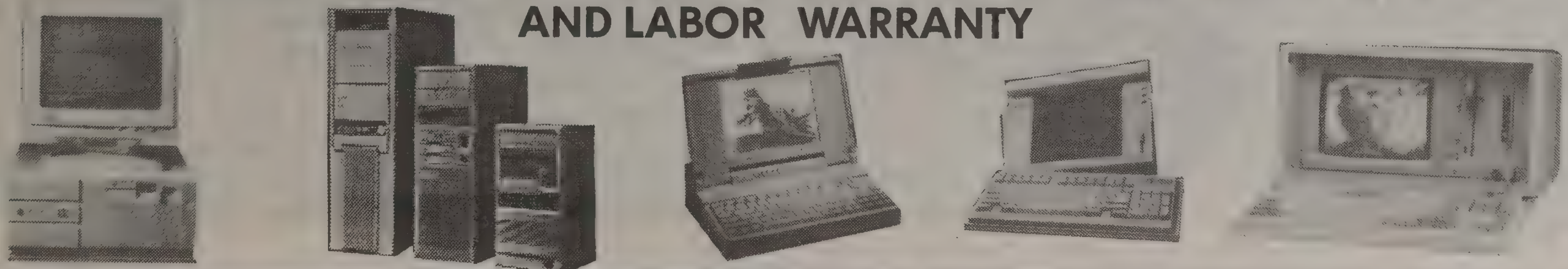

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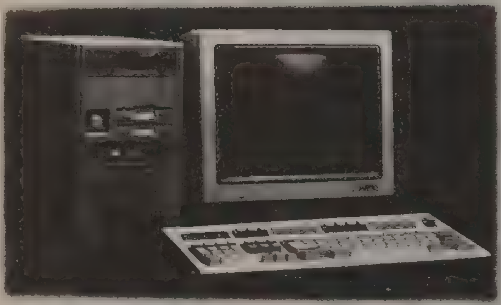

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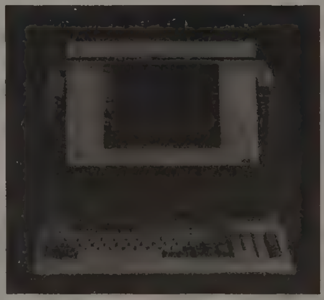

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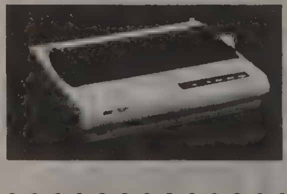

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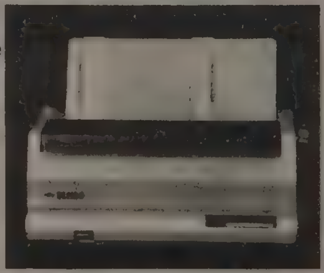

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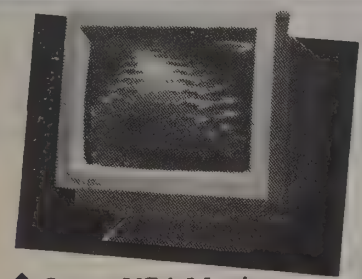

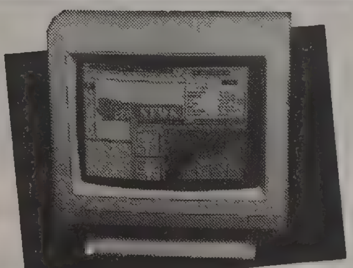

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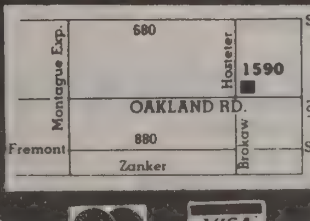

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Mainframe Integration Solutions

By Laura Lilyquist, Senior Product Manager, Sun

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By Scott Orr and Damon Beals, Purdue University School of Engineering and Technology

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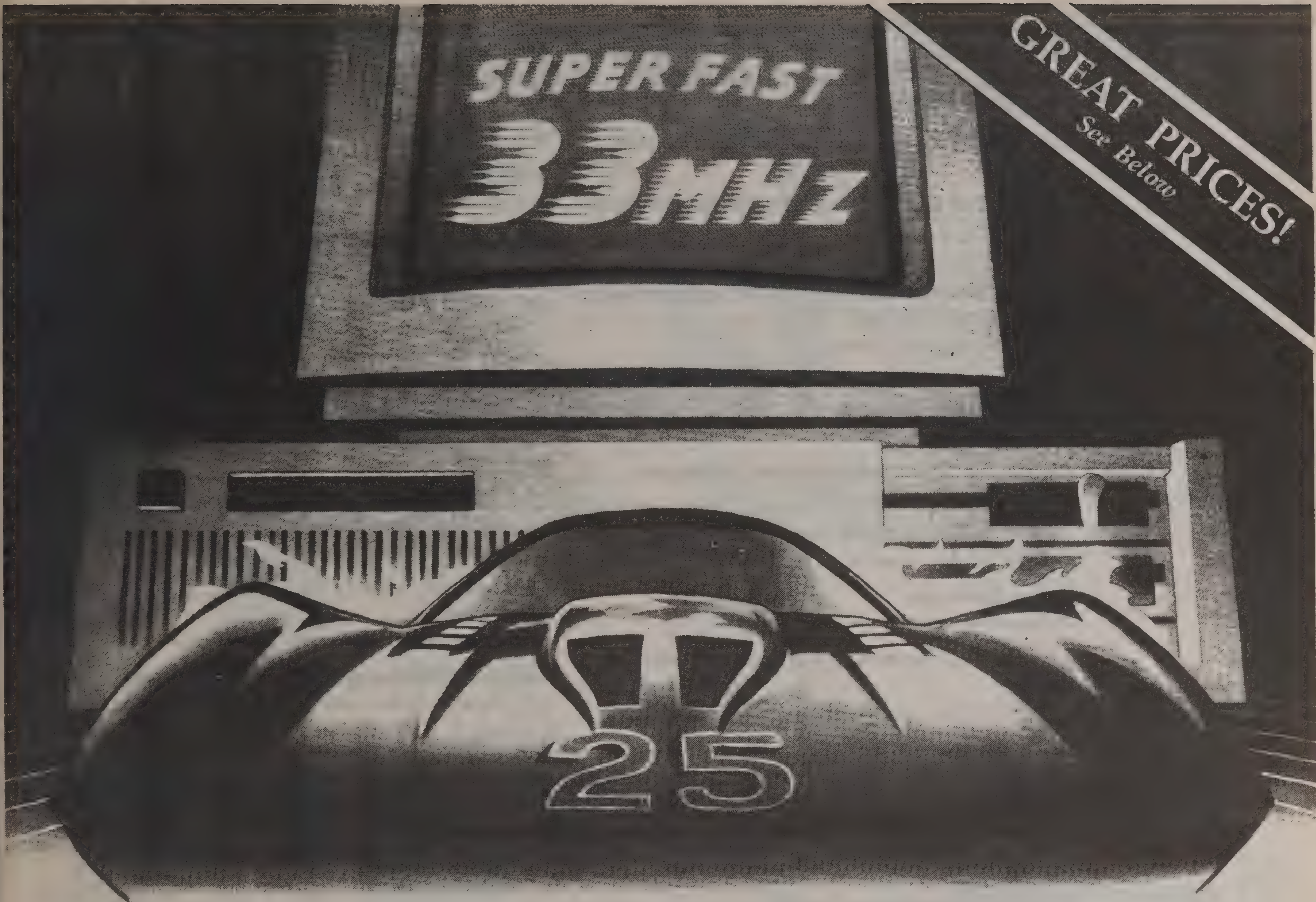

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By Donald Byrne, Epoch Systems

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By Steve Kirsch, Frame Technology

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By Tom Lacey, Opus Systems

Anatomy of an NFS I/O Operation: How and Why SCSI Is Better than IPI-2 for NFS
By Bruce Nelson, Auspex Systems

A System Administrator's Performance Monitor for Tuning NFS Network Servers
By David Hitz, Auspex Systems

Advances in Color Hardcopy Output Technologies
By Rick Warp, Da Vinci Graphics Inc.

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By Robert Brosseau, Applix, Inc.

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By Donald Trimmer, Delta Microsystems, Inc.

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WEDNESDAY, JULY 24

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Jim Geary, VP Marketing/International Sales, Security Dynamics
Ed DeHart, CERT
Tanya Candia, Product Manager/Security, DeMax
David Brown, Computer Scientist, CIAC/Lawrence Livermore

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By Nina Taneja, LAN Product Manager/Network Product Marketing, Sun

Distributed Workgroup Computing
By David Rosenlund, Senior Product Manager, Sun

Network Management: An Overview
By Denis Yaro, Engineer, Sun

Distributed Window Systems: Workgroup Computing
By Murray Stein, Regional Systems Engineer, Sun

Operating System Futures from Sun
By Jim Heriott, Sun

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Fiberoptic and Optical Networks in the Sun Environment
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Hierarchical File Systems and Sparcus' Strategy
By Michael Haffley and Thomas Boehm, Purdue University School of Engineering and Technology

A SPARC-based Implementation of a Hierarchical Storage System
By Tim Price, Purdue University School of Engineering and Technology

SIR/REX and System Requirements and Issues
By Emmett Black, General Electric Corporate Research and Development Center

Networking—Promise vs. Reality from a User's Perspective
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By Neeraj Sangal, Matrix Computer Systems

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By John Manfordeli, Natural Language, Inc.

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By Tom Atwood, Object Design, Inc.

Service Trends: The Implication of Sun's Open Systems Strategy on Maintenance
By Tom Willson, Karl Laubscher, and Steve Geisel, Polaris Service, Inc.

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By George J. Symons, PROCASE Corp.

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By Gordon Kotik, Reasoning Systems

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By Stewart Jacobson, Saber Software, Inc.

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By Bob McKee, Senior Products Manager, Sun

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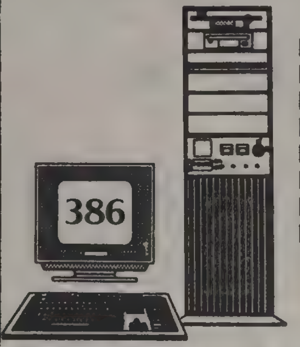

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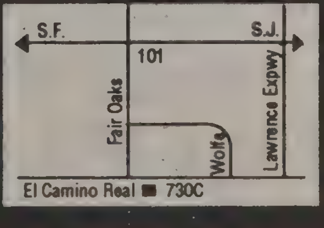

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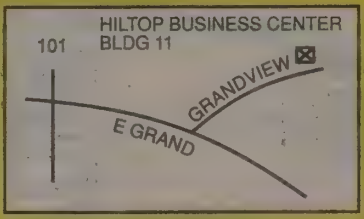
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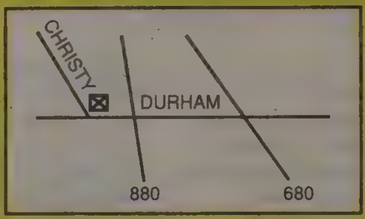
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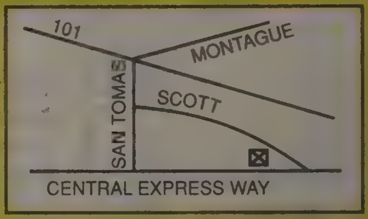
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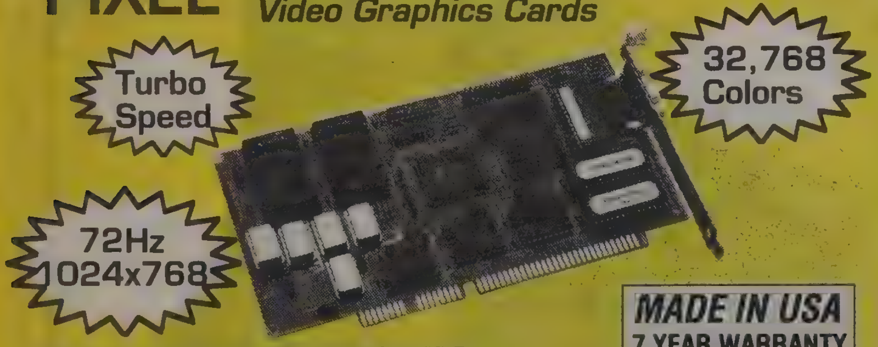

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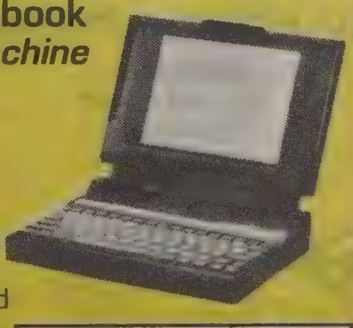

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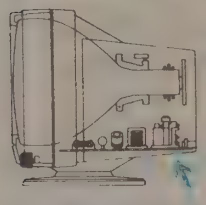
Samtron's exclusive One Board™ also contains an automatic degaussing coil that gives you the sharpest image without manual adjustment.


The automatic degaussing coil, switching-mode power supply, two-stage line filter and power supply on One Board.

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Another thing you get with PixL Perfect monitors is Samtron's universal switching-mode power supply. It automatically adapts to any voltage from 90 to 260, without changing transformers.

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Perfect Is As Perfect Does.

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Take resolution. To see exactly how good they look, just check the chart below.

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Resolution in Pixels:	1,024 × 768	1,024 × 768	1,024 × 768
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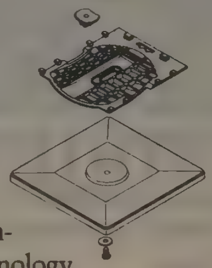
Chemically etched
Silicon

Along with easy-to-use, up-front controls, they've made one-hand, tilt-and-swivel adjustments a reality. Their SuperGlide™ system moves easily…stops solidly. And it won't overmove, so it can't damage wiring or internal parts.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By Hal Tozer, Sun

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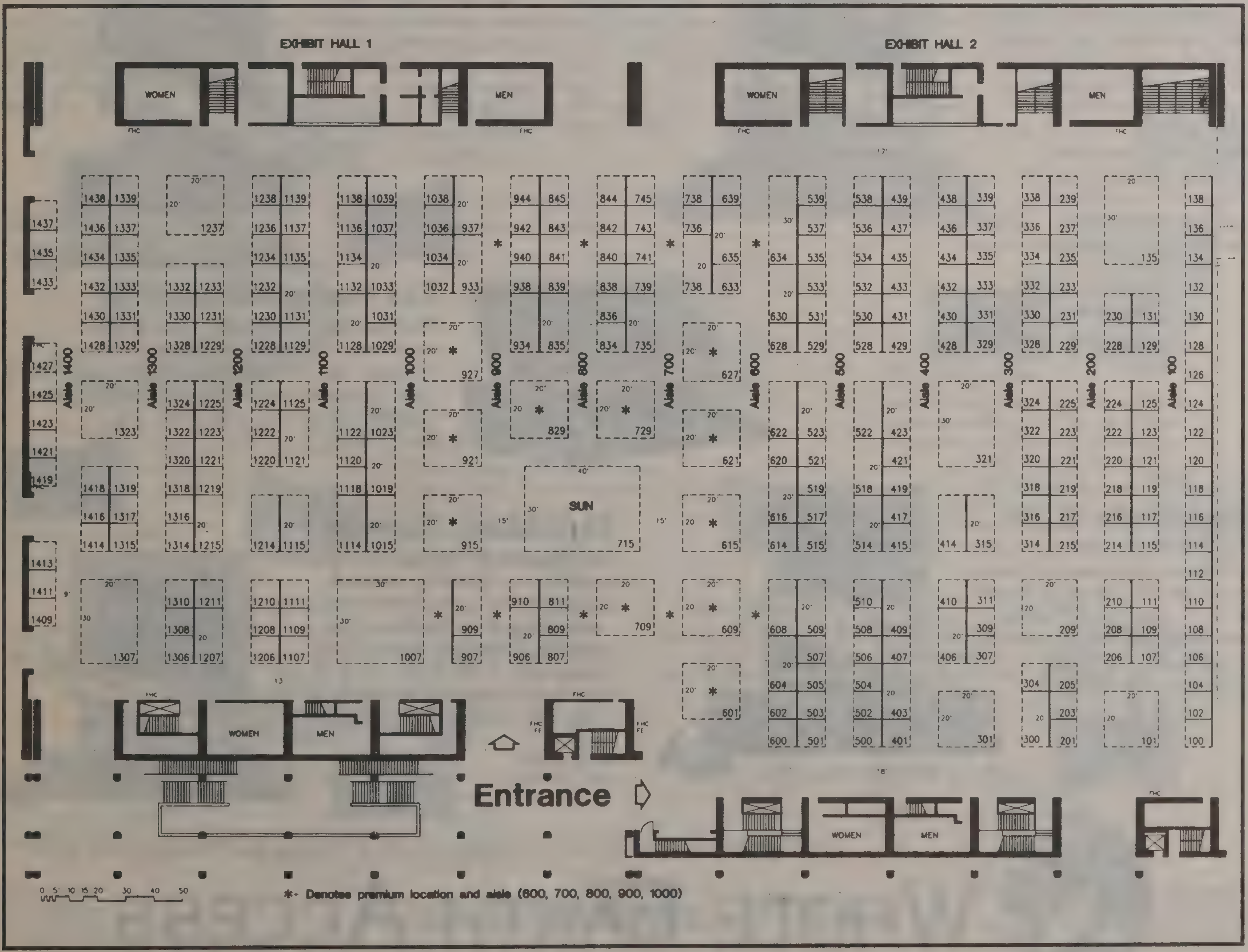
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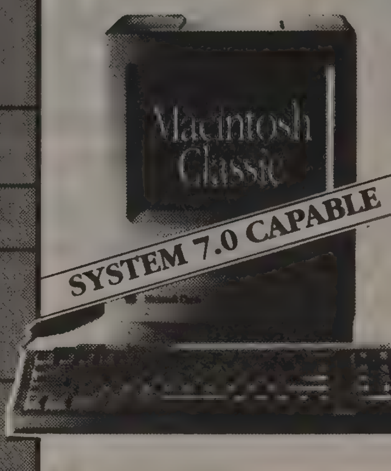

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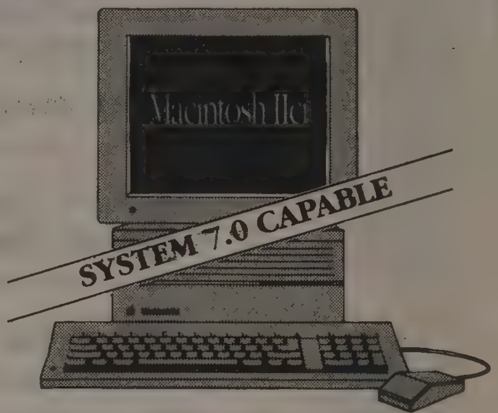

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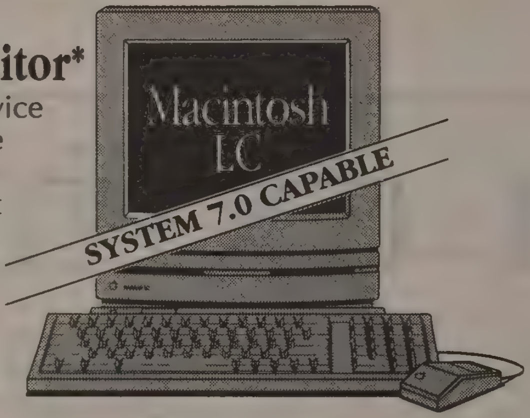

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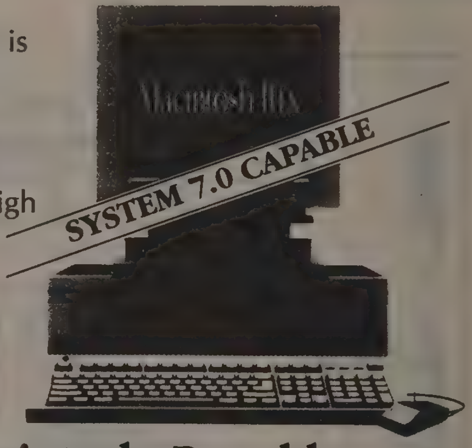

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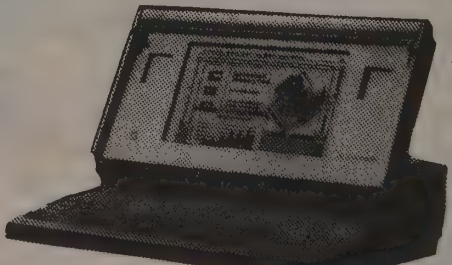

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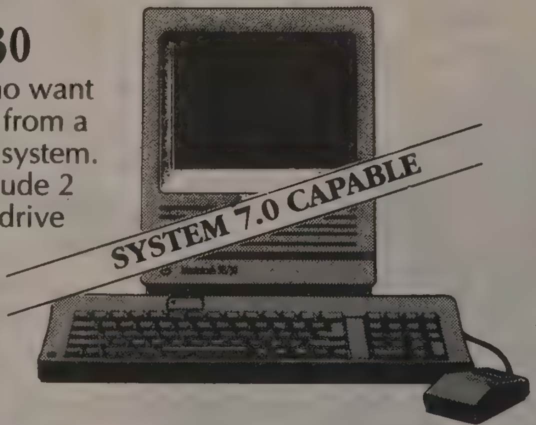

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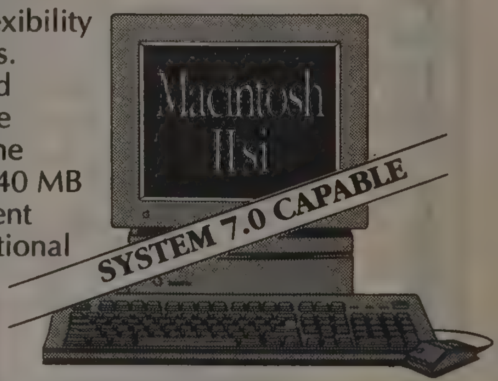

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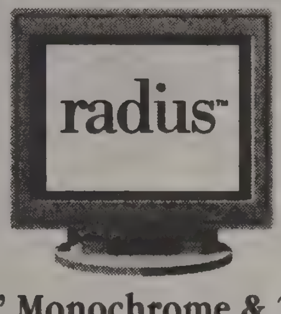

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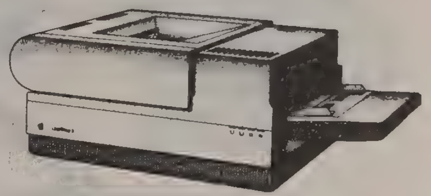

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The LaserWriter II NT is ideal for 4 to 6 users and offers PostScript® text and graphics that yield professional quality documents quickly and easily.

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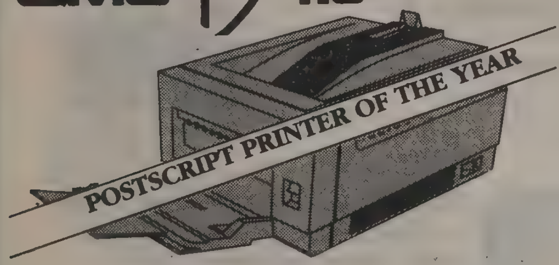

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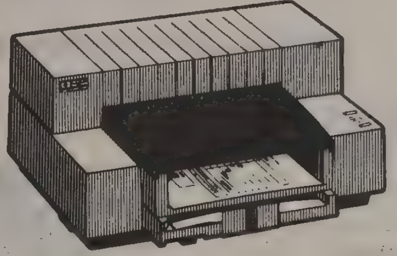

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Hewlett-Packard's DeskWriter printer, now AppleTalk® compatible, brings laser-like quality to the Macintosh® line.

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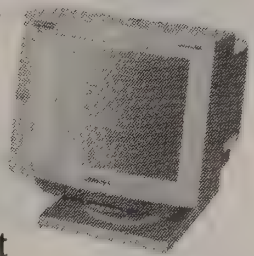

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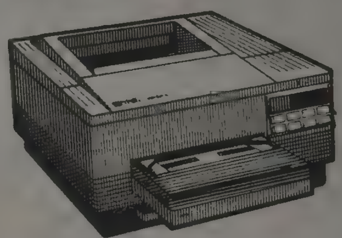

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- Improved print quality
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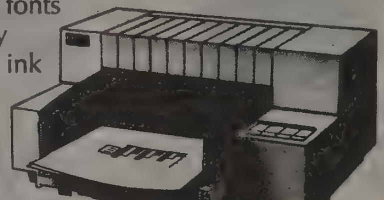

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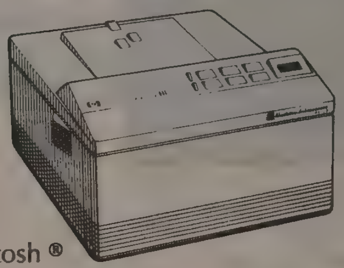

HP LaserJet IIIP Printer

- PCL5 allows you to scale type to thousands of sizes
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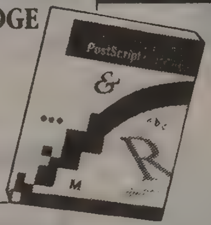

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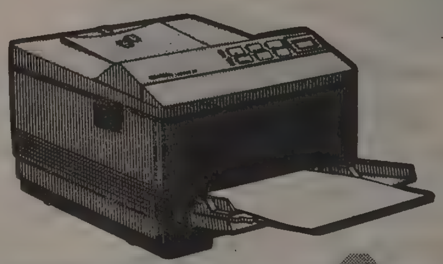

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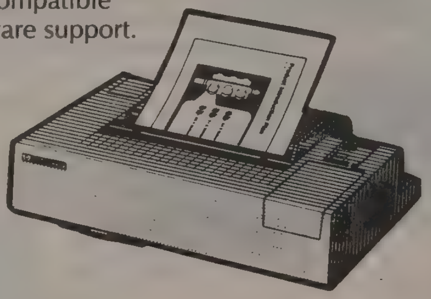
- High quality color charts & graphics
- PC or Macintosh® compatible
- Wide range of software support.



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- Publication quality output.

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- Fast 4 PPM printing
- 1.5 MB RAM—includes PostScript
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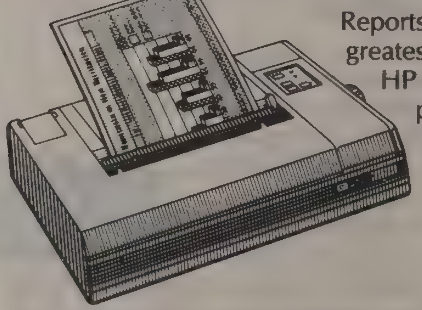

Reports and presentations achieve their greatest impact in color produced by the HP PaintWriter printer. Prints on paper or transparancy for maximum versatility. Compatible with Machintosh® color computers.

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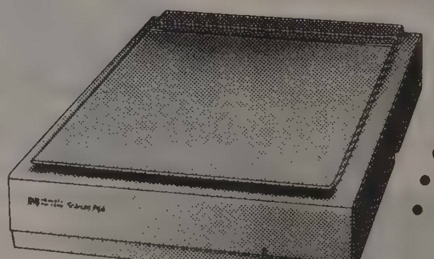

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- Price includes interface.

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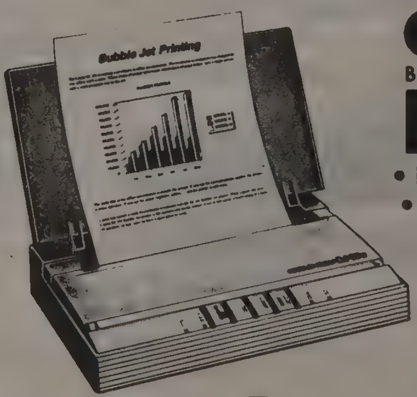

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- Optional sheet feed.

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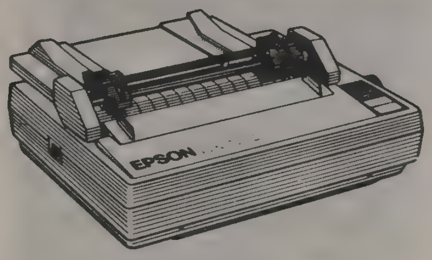

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- 9 pin • SmartPark™ paper handling
- 200 CPS super draft • 30 CPS NLQ
- High resolution graphics.

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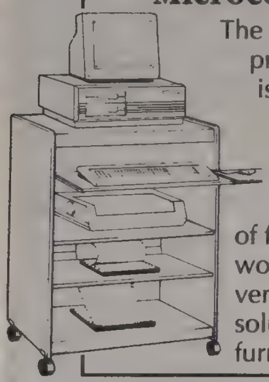
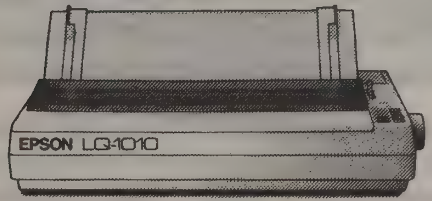


The answer to your storage problem. This space saver is designed to organize your entire microcomputer system- including your printer- in less than three square feet of floor space. Crafted from wood solids and matching veneers, this is a high quality solution for your computer furniture needs.



LQ-1010

- 180 CPS draft, 60 CPS letter quality
- 24 pin, 360 x 360 dpi graphics
- SmartPark™ and SelectType
- Wide carriage

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LQ-510

• Featuring SmartPark™ paper handling • 180 CPS draft • 56 CPS letter quality • 2 resident letter quality fonts

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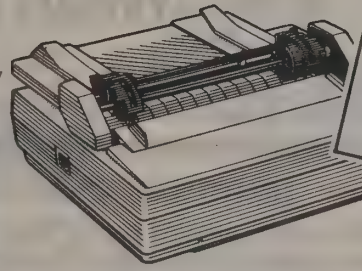

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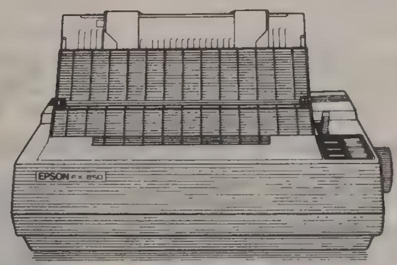

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- Push tractor paper park for single sheet feed.

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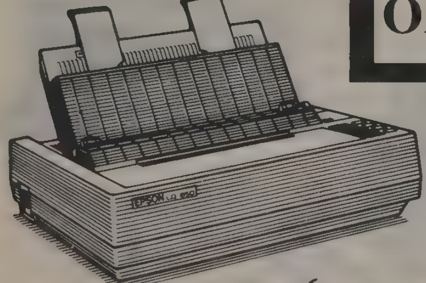

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Epson's newest letter quality color printer
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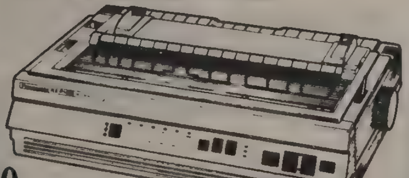

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- 192 CPS draft
- 38 NLQ • 6 resident fonts
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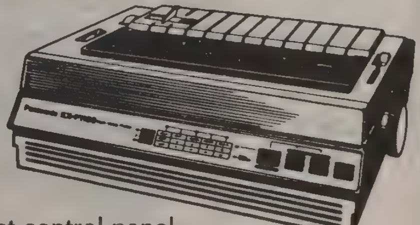

KXP-1695

- 9 pin • EZ set control panel
- 330 CPS draft • 66 CPS NLQ
- 8 resident fonts • 16.5″ wide carriage
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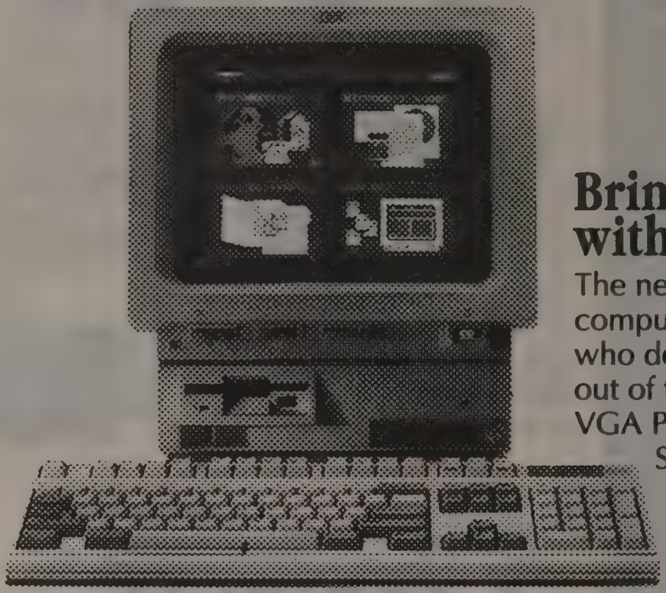

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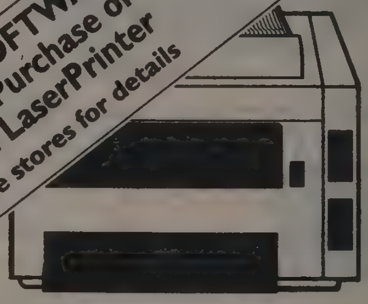

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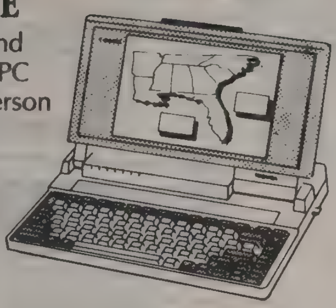

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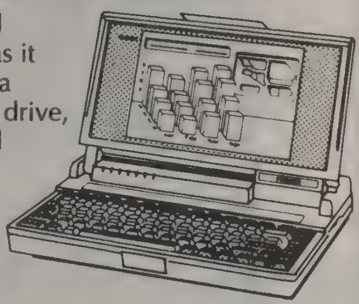

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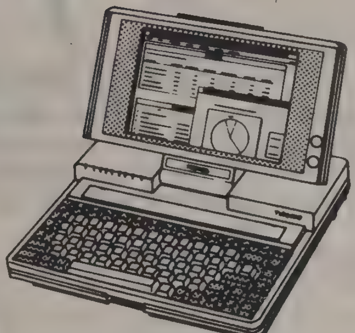

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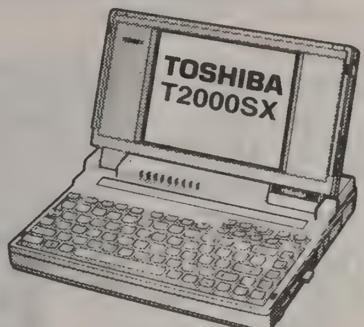

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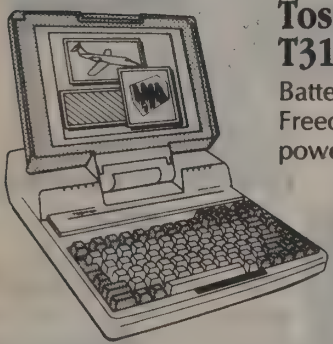

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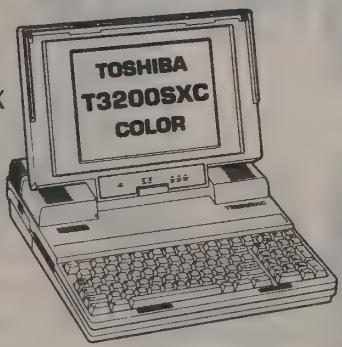

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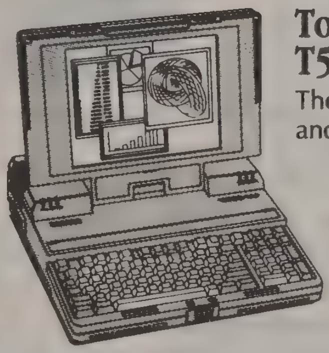

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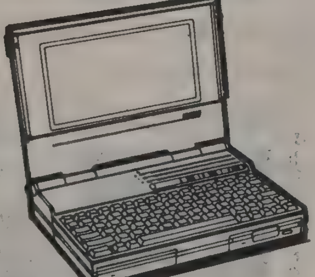

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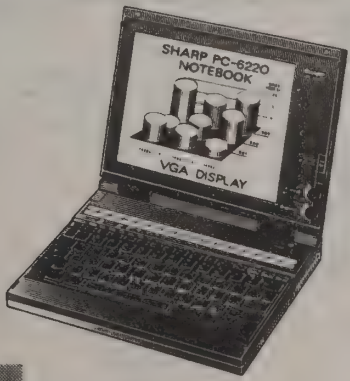

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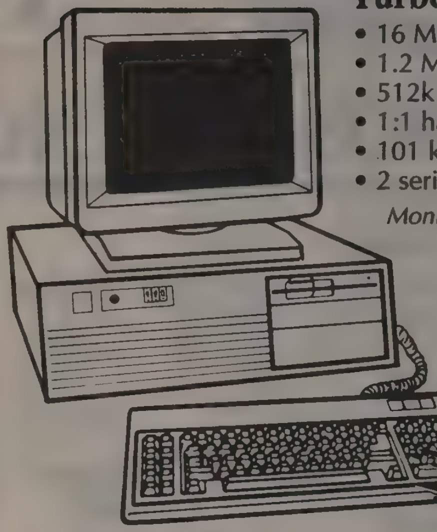

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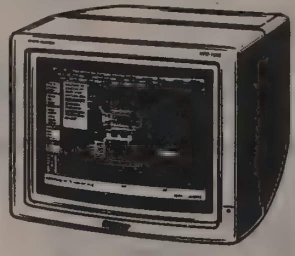

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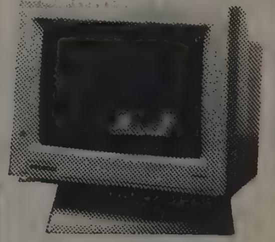

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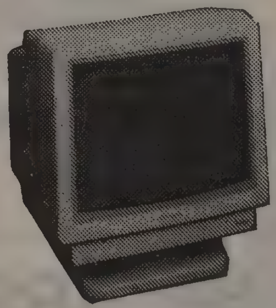

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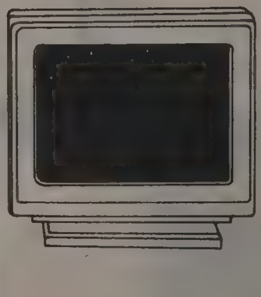

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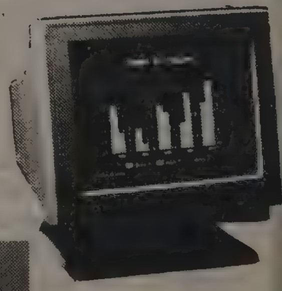

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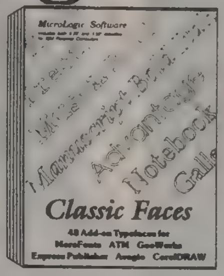
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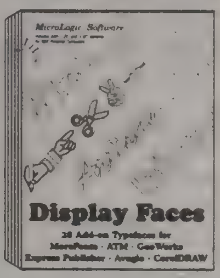
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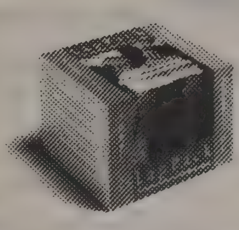

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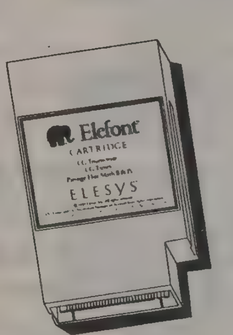
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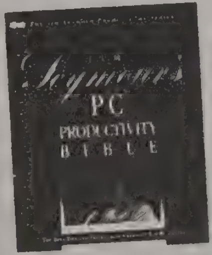
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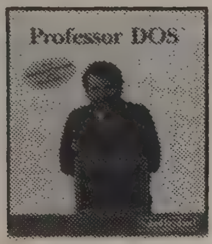
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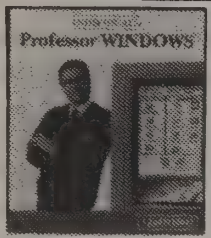
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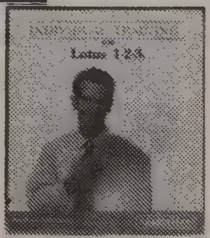
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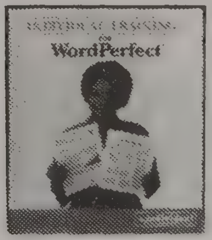
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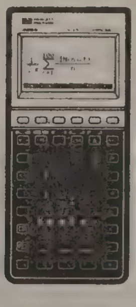

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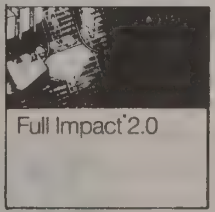
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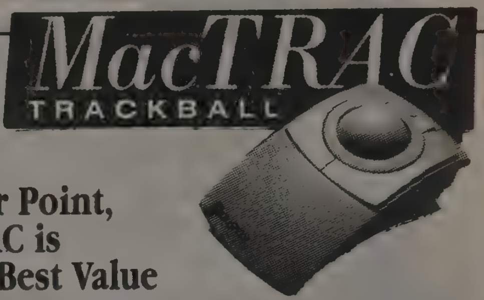

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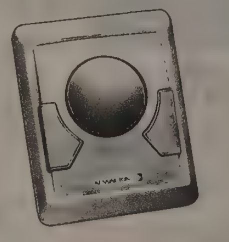

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WHOLE EARTH ACCESS

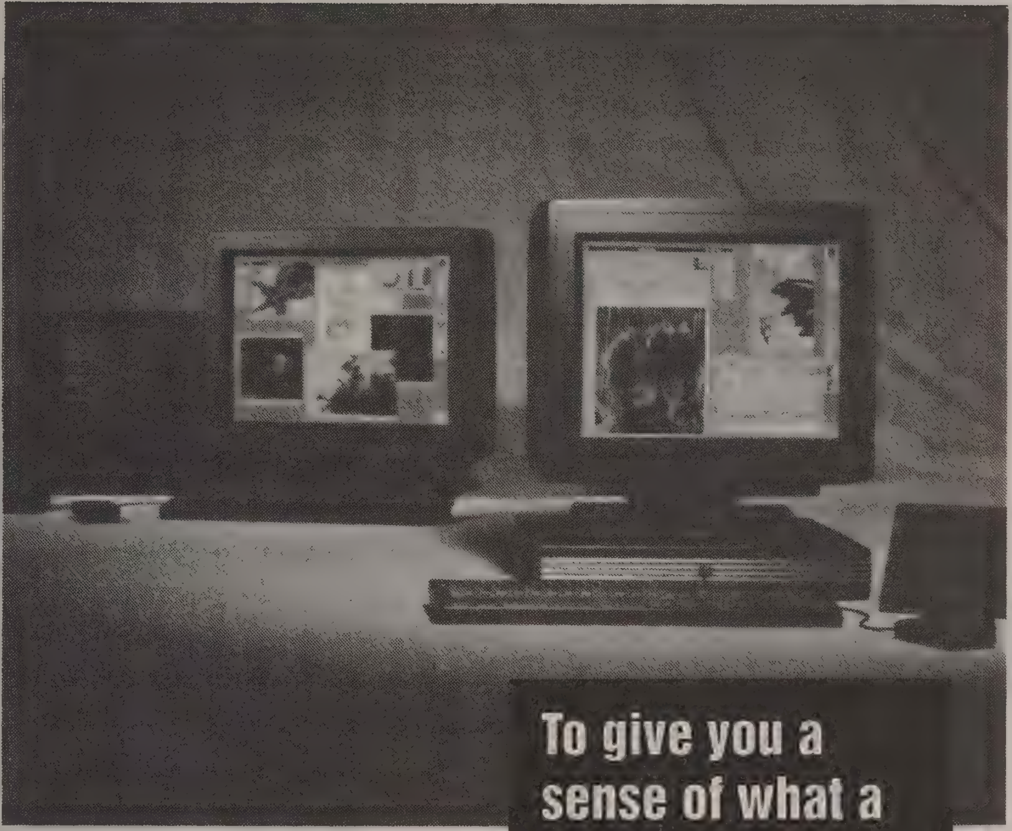
The Boy Who Cried, "Insanely Great!"

Life With A Cube

BY JOHN PERRY BARLOW

This could be a long piece. So, if you've just grabbed *MicroTimes* to check the clone ads and see if they've started giving them away yet, I'll come right to the point:

IF YOU'RE LOOKING TO BUY A COMPUTER FOR ALMOST ANY PURPOSE, BUY A NEXT! AND DO IT NOW BEFORE EVERYONE ELSE DISCOVERS THEY REALLY ARE INSANELY GREAT!



This method of introduction has a couple of advantages. First, you can still grab my main thrust even if this page is already lining the bottom of your bird cage, and second, it strips away all pretense of journalistic objectivity right at the get-go. I am not rational on this subject. It's only a matter of time before I find myself saying something like, "Hi, I'm John, and I am a NeXThead." And the other haunted souls in the church basement will clap and murmur, "Hi, John."

It's that bad. Rarely have I taken on an addiction with such conscious awareness of what I was getting myself into. I mean, going down to NeXT for a machine demo from Steve Jobs himself is asking to have one's reality, well, *enhanced*... After forty minutes of watching one of the world's great demonstrators put the New, Improved NeXT through its lightning paces, I staggered away with one thought in mind: *I must have one of my own.*

Actually, I'd thought this once before, only to be disabused of it. A veteran aficionado of digital snake oil, I crashed the NeXT roll-out, and had come out of Davies Hall well convinced that there was a NeXT in my future. But this bubble burst on first contact with the real thing. A friend at Autodesk let me spend an afternoon with his NeXT, and I found it to be unacceptably flawed.

Speed, or the lack thereof, was the first among its deficiencies. Putting UNIX, Mach, Display PostScript, and NeXTstep on top of a 68030, even at 25MHz, created the computer equivalent of a man with a 200lb. head. Screen redraws were like something that might happen in the darkroom. And the floptical drive felt more floppy than hard in its I/O.

Nor did the thing seem to be especially stable for a UNIX box. I managed to lock up most of the programs I tried and even managed to seize the whole machine a couple of times. The interface seemed graphically very cool—it has kind of a *film noir* quality—but it was not very deep. Simple acts like copying files could be accomplished either by a lot of head-scratching effort or by resorting to UNIX commands, an extremity to which I preferred not to be driven.

Finally, there wasn't much real software for it and, despite the purported ease with which it could be written, I couldn't easily imagine much development taking place when the distribution medium, read/write opticals, cost a subsidized fifty bucks still blank.

At that point, I thought that NeXT was destined to be another quaint collector's item, a forward-looking failure like the Edsel or, for that matter, the Lisa. But in reaching that assessment, I was ignoring an essential element in the psychology of Steven Paul Jobs.

Steve Jobs, generally as enigmatic as his black boxes, has one predictable trait: he likes to shoot himself in the foot every once in a while so that he can become an Olympic sprinter while recovering from the injury. He did it with the Lisa, he did it with the Macintosh (though he got kicked off the team before it won Gold). And now it appears he has done it with the NeXT.

The NeXT, Rev. 2, addresses every single

Continued on page 92

To give you a sense of what a deal a NeXT is, let's just look at it as a printer. For the full street price of an NTX, a student at, say, Berkeley, could get a higher resolution printer with a much faster imaging rate and have a computer, disk drives, and a monitor thrown in for free!

DTK NEWS

(Paid Advertisement)

DTK GROWTH SPURS MOVE TO LARGER USA-HQ OFFICE

Strong sales growth has caused value-leader DTK Computer Inc. to move its headquarters into larger facilities for the second time in four years.

DTK's U.S. headquarters operations moved March 30th to new facilities in the City of Industry at 17700 Castleton Street, according to Thomas F. Bayens, Director of Marketing. The new offices are more than double the previous size.

Western Regional headquarters plans to move to a different location nearby when construction is completed in a few weeks. Regional headquarters serves the states of California, Oregon, Washington, Nevada, Idaho, Montana, Arizona, and Wyoming, Utah, and Western Canada.

DTK ADDS R&D FUNCTION TO SAN JOSE OFFICE

DTK Computer Inc. will soon add an R&D (Research and Development) function to its Northern California office in San Jose, according to Rany H.T. Hsieh, Vice President and General Manager.

"We want to work closely with our major suppliers, and many of them are in the Silicon Valley," said Hsieh.

Founded in 1981, DTK is one of the world's largest independent manufacturers of motherboards and add-on cards. More than 100 engineers and technicians are involved in the company's R&D operations.

DTK manufactures and markets a full line of Industry Standard Architecture (ISA) microcomputers, motherboards, and add-on cards, selling its products through independent distributors and resellers.

DTK users rated the company more favorably than users of ALR, AT&T, Epson, Everex, and IBM rated their manufacturers.

USERS RATE DTK HIGH IN *PC MAGAZINE* POLL

Users of DTK Computers rate its products higher in terms of service and reliability than many well-known brands.

Nearly 18,000 *PC Magazine* readers completed questionnaire evaluations in four categories with responses geared to the computer the respondent uses regularly.

Users of DTK units rated their computers as average or above in all four categories surveyed, the only company earning the distinction.

In Reliability, DTK was ranked higher than ALR and Packard-Bell. In the Technical Support area, DTK outperformed ALR, Acer, AST, AT&T, Compaq, and IBM.

The results were similar for Repair Service, with DTK leading ALR, Acer, AST, Compaq, Kaypro, Tandy, and IBM.

The fourth category involved buying the same brand again. DTK users rated the company more favorably than users of ALR, AT&T, Epson, Everex, and IBM rated their manufacturers.

More than 400 brands were mentioned by readers with at least 75 mentions necessary for inclusion. Only 27 of the brands qualified for inclusion in the survey results.

HOT-TO-TROT!

DTK 386SX/20MHz

Model PEER-2030 Bare Bone System

✔ *MAINBOARD*	DTK PPM-2030C
✔ *MICROPROCESSOR*	Intel 80386SX - 20MHz
✔ *COPROCESSOR*	80387SX
✔ *CLOCK SPEEDS*	20 & 10 MHz switchable
✔ *RAM CONFIGURATION*	DIP:44256 x 8 + 41256 x 4 SIMM: 4 pcs.
✔ *RAM ON BOARD*	512K / 1 / 1.5 / 2 / 3 / 4 / 5MB
✔ *ROM SYSTEM*	27256 X 2; Shadow RAM supported.
✔ *EXPANSION SLOTS*	8 (16-bit x 6; 8 bit x 2)
✔ *DRIVE BAYS*	5 (5.25" x 3 + 3.5" x 2) All open.
✔ *FCC Certification*	Class B
✔ *PERFORMANCE:*	Landmark 26.7 / Norton SI 22.0 / MIPS 3.325

In the first *PC Magazine Service & Reliability Survey,* **DTK users** rated us high in all four areas (*Reliability, Buy Again, Tech Support, Repair Service*). You can put DTK's reliability to *work* for *you!*

PC MAGAZINE

WORK HORSE!

DTK 386/25 MHz non-Cache

Model KEEN-2530 Bare Bone System

✔ *MAINBOARD*	DTK PEM-2530
✔ *MICROPROCESSOR*	Intel 80386DX - 25 MHz
✔ *COPROCESSOR*	Intel 80387/Weitek 3167
✔ *CLOCK SPEEDS*	25 & 8 MHz
✔ *RAM CONFIGURATION*	SIP - 4 pcs.
✔ *RAM ON BOARD*	1 / 2 / 4 / 8MB
✔ *TOTAL SYSTEM RAM*	Up to 16MB
✔ *ROM ARCHITECTURE*	Shadow RAM supported
✔ *EXPANSION SLOTS*	8 (32-bit x 1; 16-bit x 5; 8-bit x 2)
✔ *DRIVE BAYS*	5 (3 x 5.25" + 2 x 3.5")
✔ *PERFORMANCE:*	Landmark 31.7 / Norton SI 27.1 / MIPS 4.35
✔ *FCC CERTIFICATION*	Class B

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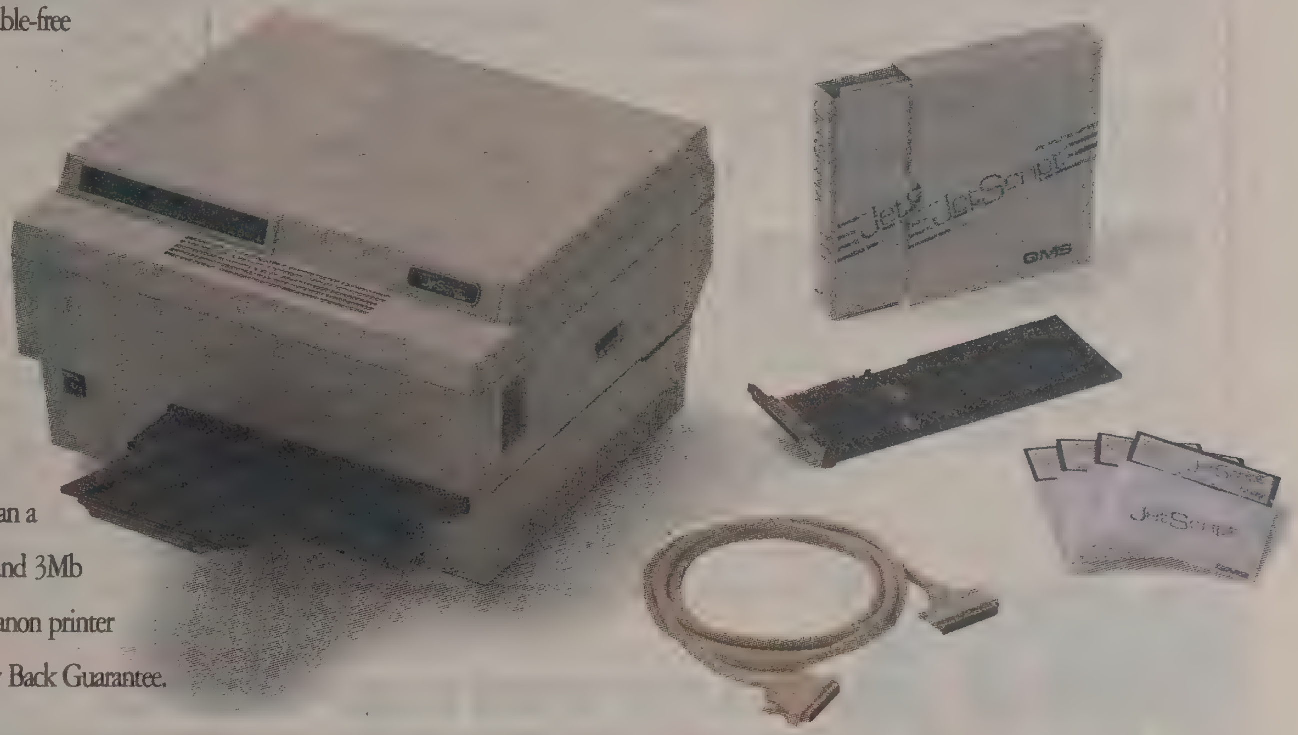

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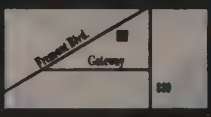

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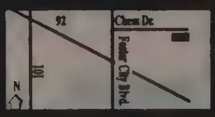

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Continued from page 87

one of its predecessor's deficiencies, overcoming them so triumphantly that it is now years ahead of the competition in nearly every sense that I can think of. Furthermore, it has moderated many of its former eccentricities without retrenchment to a safer or less advanced technological position.

THE MACHINE(S)

Like Model Ts, NeXTs come in any color you like as long as it's black. Beyond that, the range of choice opens into such a diversity of models and configurations that it's misleading to speak of the NeXT as one computer.

I'll begin by focusing on the elements which all new NeXTs have in common. They are all built around Motorola's incandescent new 68040, running at 25MHz. If you believe in such things, they can chew up and spit out around 15+ MIPS with a couple of megaflops on the side. (For purposes of comparison, a SPARCstation SLC is rated at 12 MIPS, while a Macintosh IIfx seems to process about 5 MIPS.)

Of course, processing capacity is less important than the feel of the machine, as many are now discovering when they saddle their supposedly fast 386 PCs with the burden of a graphical user interface. The NeXT interface is still a lot of equipment to haul around, but between the 68040 and the suite of fundamental improvements which went into NeXTStep 2.0, this thing *feels* faster than bugs on fire. Highly formatted documents scroll as though text on a fast clone. Everything, whether it's launching a program, opening a window, or running a search and replace, happens with a crispness that is almost sexually arousing.

As before, all NeXTs include a Motorola 56001 digital signal processing chip and, at the very least, 8MB of RAM. The DSP is an amazing and, so far, little utilized item. It gives the NeXT the sound-processing capacities to become the studio engine of the decade. All that's missing right now is the software.

The 56001 is not limited to processing sound though. I got a sense of its horsepower from a demo Mandelbrot program which NeXT bundles. Using the DSP to process its calculations, this software filled the 17" screen with Benoit's Bug in a minute and five seconds (as contrasted by the hour or more required by the 68882 in my SE/30).

NeXTs are made to be networked, so other features common to all motherboards include both Thin and 10Base-T Ethernet ports as well as two serial ports with hardware flow control. This is also a direct port to the DSP chip and a 50-, rather than 20-pin SCSI port. (NeXT SCSI, by the way, adheres to the full set of SCSI protocols rather than Apple's perverse reinterpretation of them. Nevertheless, most of the Macintosh SCSI devices which I attached to the NeXT seemed to work without the addition of special drivers.)

All of the new machines come with both a 3.5" floppy disk drive and a hard disk of one size or another, ranging from 105MB to twin 1.4GB drives. The floppy disk drives are capable of reading and writing UNIX disks in 1.44 or 2.88MB capacity, as well as 7.2 and 1.44MB DOS disks. (Also, with the addition of DIT's estimable FloppyWorks, they will read and write high-density Macintosh disks).

Finally, all NeXT motherboards have an internal traffic cop in the form of an integrated direct memory access processor capable of supporting eight DMA channels at 32Mbits/sec. By taking much of the load-sorting away from the CPU, this makes the very fast 68040 seem even faster.

So they all have that much in common. From here, things begin to diverge. NeXT motherboards can come in two kinds of boxes, the familiar cube or a "pizza box" about the same dimensions as a SPARCstation.

The NeXTcube has room for three large expansion boards, as well as a stack of drives which can include multiple floppy disks, hard disks, and a CD-ROM drive. The cube will also accommodate the original floptical drive. Though hardly the OmniDisk it was once purported to be, this is, with a double-sided capacity of 512MB and average seek rate of 92ms, the greatest backup device in existence. Furthermore, if your hard disk should fail, the floptical will serve quite well until you get it fixed. Try *that* with a tape drive. The cube also supports 8MB to 64MB of on-board RAM. Finally, the cube is the future home of the NeXTdimension color graphics and video board, about which more in a moment.

The NeXTstation comes in two flavors, color and grayscale. There are no expansion ports, and upgrading a regular NeXTstation to color would require a whole new motherboard. So you'd better decide before you buy.

The NeXTstation, of whichever sort, has room for a floppy drive and one hard disk, which can be (and, in a standalone configuration, had *better* be) as large as 400MB. (You can also hang a bigger external drive off the SCSI port if need be.) It has room for 32MB of RAM. The color version comes with a minimum of 12MB.

The NeXTstation packs an amazing amount into its 12lb. box, but the 105MB hard disk wouldn't suffice outside of a network. The operating system alone takes most of that. It is what the name implies: a workstation. Not quite diskless, but close enough.

On the other hand, a color NeXTstation with a large hard drive and, say, 24MB of memory comes close, all by itself, to being all the computer anyone will ever need. Even without a graphics coprocessor, it handles all the 4096 colors 16 bits will get you with little or no noticeable sacrifice in screen speed. The NeXT color monitors come in 17" or 21". At 92dpi, the 17" screen produces as sharp and rich a display I've seen on anything that sits on a desk.

I am not rational on this subject. It's only a matter of time before I find myself saying something like, "Hi, I'm John, and I am a NeXThead." And the other haunted souls in the church basement will clap and murmur, "Hi, John."

I haven't seen the 21" screen, but I assume that it's of similar quality. Interestingly, the 21" screen does not provide a larger screen area, *a la* Macintosh. Instead, it blows the same image up to a larger size. A 21" screen displays documents in about their actual printed size rather than 3/4 scale, which is the somewhat lamentable case with the 17" display.

About the best reason for buying a cube instead of a pizza box is the recently shipped NeXTdimension board. This is a 32-bit accelerated graphics and video board which pretty well defines state-of-the-art. (Actually, it only uses 24 bits for color, producing the usual 16.7 million shades. The additional 8 bits are used for things like image transparency and other cool effects.)

The NeXTdimension board uses an Intel i860 to juice up its graphics speed. I have watched a NeXTdimension board do both color graphics and uncompressed video, and it is astonishing on both counts. Despite the color density, screen changes and refreshes occur even *faster* than they do on a standard grayscale system. Video images can come from a combination of sources, including VCRs, laserdisks, and camcorders in either PAL or NTSC formats.

When it was announced, the board was supposed to have full-screen, real-time, disk-based video compression and decompression using the C-Cubed JPEG chip. Through no fault of its own, NeXT is shipping the board with an empty socket where the compression chip should be. C-Cubed was unable to produce a volume of working chips on schedule. Or, as Jobs put it, "They blew it."

This may be just as well. It appears, on the strength of his speech at Digital World in LA this month, that Jobs is now more interested in a chip which provides MPEG or perhaps a number of different user-configurable compression schemes. Given the turbulent state of compression standards, NeXT should probably wait a bit before filling that socket.

I hope they don't wait too long, though. I have this weird longing to send video postcards over the Net. NeXTmail could easily provide that ability as soon as the compression chip is available.

Last on the hardware list is the printer, basically a bare Canon laser engine in a little black box. The image processing has largely been done by the time electrons hit the MegaPixel display, so there's little need for a processor or memory in the printer. Even without its own processor, I find myself putting to paper complex PostScript documents, at a resolution of 400dpi, about five times faster than the same image, at 300dpi, will emerge from my LaserWriter NTX.

I didn't want to get into prices just yet, but, to give you a sense of what a deal a NeXT is, let's just look at it as a printer. For the full street price of an NTX, a student at, say,

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Berkeley, could get himself a higher resolution printer with a much faster imaging rate and have a computer, disk drives, and a monitor thrown in for free!

One final note on the subject of NeXT hardware: it's almost tragically hip to look at. The company has won several design awards for all the cool that frogdesign put into its black magnesium. (Though the cube does, as John Dvorak muttered to me at the rollout, look a little like a chic Milanese space heater…) This beauty is more than skin deep. Everything from the circuit board layout to the styrofoam in the packing boxes has been designed and *built* with such maniacal attention to detail that you worry for the long-term sanity of these people. If Porsche made computers, they'd build them this well, but they wouldn't look this cool.

PRICES

They sure don't *price* them like Porsches. It's amazing how inexpensive a great computer can be when a rich man's pride is on the line. You get the feeling that, in a very real sense, Steve is *paying* us to take these computers off his hands. I just can't imagine how NeXT could be, at these prices, making a profit on each machine. If they are, then Apple is doing something obscene.

It's a little hard to approach the discussion of price, since everything is so flexible. Quoting list seems to be silly, since, as far as I can tell, it would take a special fool to pay list for a NeXT product. The community is filled with students, developers, and other insiders with the ability to make you a special price. (Even the academic prices vary from institution to institution, on what basis I don't know.)

A bare-bones NeXTstation with monitor lists for $5,000. "Bare-bones" hardly seems the right phrase in this context since that includes the fastest non-RISC motherboard on the market, 8MB of memory, 105MB of hard disk storage, a million-pixel grayscale monitor, and more software than most people ever use. I don't think you have to be all that resourceful to find one for $3,500.

The printer lists for $1,800. They can be had for $1,400. It is the best black-and-white printer available for under $10,000. Period.

About the most you could pay for a NeXT would probably be around $35,000. But that would get you a NeXTcube with 2.8GB of disk storage, 64MB of RAM, a floptical drive, and a 21" 32-bit color monitor with full real time video editing capacity. I defy you to put together a system of similar majesty for less than $70,000. (Though comparisons, especially to Macintosh equipment, are invidious. It's apples and Buicks, as they say, owing to the absence of anything else on the market with the NeXT's unique set of features.)

I scrounged my own system together. This included taking advantage of Businessland's fire sale on original NeXTcubes (which could then be upgraded quite inexpensively). Without herniating my resourcefulness, I was able to come up with a system which includes: an '040 NeXTcube with 24MB of memory, a 660MB hard disk, a floptical disk, a floppy drive, fax modem, printer, and a MegaPixel Display. My total? Less than $8,000.

Michael Dell would blush at these prices. Hell, Crazy Eddie would blush at these prices. They're goin' craaazy with values down at NeXT in beautiful Redwood City, folks…

So, why aren't people buying these things by the trainload? I'll get to that, but, first, let me rave on some more.

SOFTWARE (BUNDLED)

I suppose the most important thing to know about a NeXT is that it really *is* a UNIX machine. And that is a wonderful thing. Especially if you have spent years on a Macintosh which would, in the normal course of events, crash irretrievably at least twice a day. Or twenty times if you were in a big hurry. The Macintosh style of memory management is like the social order in the open ward at an asylum. One patient twists off deep and they all begin to howl. So crashes happen. A lot. UNIX keeps each inmate in his own padded cell. No matter how berserk a single program might become, the madness doesn't spread.

UNIX also means that true multitasking is possible. Multitasking, I used to think, was something that Bill Gates wanted us to hunger for so he could sell us OS/2. I figured that if I could print and download in the background, Multifinder already gave me all the multitasking I could ever want. Very wrong. But, like many things, you've got to have it to know how wonderful it is. Just the ability to back up one's hard disk while working uninterrupted on other chores brings a pleasure I can't describe.

Actually, the NeXT is not *just* UNIX. The heart of the matter is a much more efficient kernel called Mach. Mach was developed for supercomputers by NeXT's Director of Operating Systems Software, Avie Tevanian, when, not so long ago, he was a student at Carnegie Mellon. The significant thing about Mach, aside from its guerrilla efficiency, is that it will scale easily into the multiprocessor future for which it was written. Like many other aspects of NeXT design, Mach is something to grow into.

But that's thrilling mostly for techies. More relevant is how NeXT UNIX feels to us "mere mortals," as they like to call us down in Redwood City. It feels good. Well…it doesn't feel *bad* anyway.

I have been thinking hard about UNIX ever since I realized that it was the genetic code of my favorite non-human organism: The Net. Then in Budapest last fall I heard Bill Joy give a speech called "World Peace Through UNIX," which was one of either the craziest or most visionary things I ever heard. He really got me going. Suddenly, I wanted some of this UNIX for myself. But I'm too old to become a UNIX weenie. What I needed was UNIX with training wheels.

And that's precisely what a NeXT is. UNIX with training wheels by Pininfarina. Any time you want to do something really ugly, like sed or chown or awk, the Berkeley dialect is right there to do it in. But, unless you're setting up a UUCP connection or some other austere chore, you rarely have to do such heavy lifting.

Steve Jobs, generally as enigmatic as his black boxes, has one predictable trait: he likes to shoot himself in the foot every once in a while so that he can become an Olympic sprinter while recovering from the injury.

NeXTstep 2.0 is now more than just elegant *looking*. It has depth, integration, and intuitive obviousness. It is, I think, the realized shape of things to come elsewhere. It's not quite perfect though, and the areas where it's not are so glaringly wrong in context that it's kind of like having an incredibly beautiful girlfriend who picks her nose in public.

Of the things that bug me, the worst is what seems to be a forced doctrinal dependency on the mouse when using NeXTstep. Perhaps it's an over reaction to the mouselessness of UNIX. I don't want to reach for that thing unless I'm confused about the commands, performing some graphical chore, or moving across a large expanse of text. Too often, NeXTstep doesn't give me a choice. This machine desperately needs a good macro program (like QuicKeys).

There are some other real irritants, like the fact that there is no menu to cycle through the many programs one might have running concurrently. It's easy enough to forget something is already loaded and load it a second (or even, fifth) time. The Dock, a place to store the icons of frequently used programs, takes up too much of the screen, doesn't have room for enough programs, and doesn't accommodate a menu whereby one might load a particular document when launching a program. There is no good way to find files. If you've become addicted to ON Location for the Mac, as I have, this can be very frustrating. Especially with a 660MB hard disk.

My final major complaint is that the NeXT is WYSIALSWYG (What You See Is A Lot Smaller than What You Get). At the crystalline resolution of 92dpi, the screen image of a document is about 3/4 actual size. This means that text typed in 10 or 12 points is illegible at any safe distance from the monitor. The various word processors all have the option of displaying the document at 125% or 150%, but you have to ask for it every time, which is annoying. NeXT should make document scale universally adjustable from the Preferences program.

There are other aspects of the interface which haven't settled into cultural permanence yet, and NeXT doesn't seem to be ready to enforce some kind of interface fascism. So not everything is as predictable as I'd like it to be. But, generally, if a command works on a Mac, it will work on a NeXT. Where the NeXT action differs in its result, it's usually an improvement. For example, clicking

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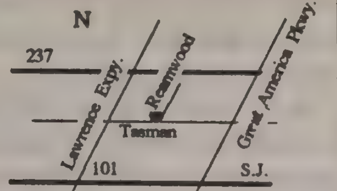

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in the middle of the scroll bar moves the slider to that point in the document rather than simply paging forward.

But to complain about NeXTstep's shortcomings makes me feel like an ingrate. Whatever its warts, this is an environment to which others can only aspire. Microsoft's much-ballyhooed Object Linking and Embedding strongly resembles the foundations of NeXTstep's object-oriented design, in which everything fits quite snugly into everything else. Just about all of the vaunted virtues of System 7.0—virtual memory, scalable screen fonts, multiple programs, invisible network distribution, interapplication communication, etc.—are here in a much more advanced and elegant form. And Sun machines are, well, just UNIX.

In addition to NeXTstep, the NeXT comes with a good percentage of all the software you'd ever need. Here's a somewhat truncated list:

NeXTmail. I think my most compelling reason for buying a NeXT was its prodigious capacity as a Cyberspace cruiser. I live in email, sometimes getting as many as a 100 messages a day. But the stuff is thin. Trying to assemble a human being from ASCII requires an act of creation on my end in which reality usually suffers.

I want fatter bandwidth, and NeXTmail certainly provides that. It's wonderful! No longer is one stuck in the austere province of text. One's messages can be as ornately formatted as aesthetics permit and easily include graphics, voice (and other sounds), binary files, and, soon, video. The enhanced sense of visual communication is dramatic. Unfortunately, one can only exchange NeXTmail with other NeXTs, so it's a little like having a great operatic voice in the Country of the Deaf. (Of course, this strongly motivates one to communicate with other NeXToids, which will help bind this already strong community.)

There are a few things about NeXTmail I want to see improved, mostly through the addition of more keyboard commands and improved search facilities for text strings occurring within messages. But one of the great things about the NeXT is that the platform is still so malleable that users can email the company and put themselves in a position to help change the things they don't like.

WriteNow. This is pretty much the same word processor it is on the Mac...just a lot faster. It has always seemed a little light on features to me, but I know professional writers for whom it does everything they want it to.

Digital Webster and Thesaurus. Forget every other online dictionary you've ever seen. This is the real thing. It even has pictures. Furthermore, you can highlight a word in any NeXT application and hit Command-= and you will instantaneously get its official Webster definition, pronunciation, etymology, and other synonymous words.

There is no good way to find files. If you've become addicted to ON Location for the Mac, as I have, this can be very frustrating. Especially with a 660MB hard disk.

Digital Librarian. Drag any file or folder into Digital Librarian's bookshelf, and it will create an index of every word in it. You can then search online documentation (NeXT includes all of its own docs as well as all UNIX manuals), your own personal files, the complete works of William Shakespeare (also bundled), or anything else you care to have available. It will find anything you want in a New York second.

Oxford Dictionary of Quotations. Somewhat related to Digital Librarian, this can search by word, phrase, or author. It works extremely well, though I found its contents to be rather too British for my tastes. America is underrepresented, as is anything which hasn't yet achieved classical status.

Terminal. A standard VT100 terminal emulator, this is the window within which the NeXT looks like any other UNIX machine. A scrolling C Shell at minimum, it can also perform most of the functions of communications software for logging into other systems.

Mathematica. Buy a Sun and this will cost you several thousand bucks. Buy a NeXT and get it free. I'm not a mathematician, but if this program had been around when I was going to college, I would be one.

T$_{E}$X. Probably named after the macho dude who wrote it. This is page layout and document processing for real men. Incredibly rich and capable. Also incredibly difficult.

FaxReader. The NeXT is the first computer I've ever seen which makes a fax modem worth owning. It is most proficient at generating faxes (which it does at the right dot density for good reproduction), sending them, receiving them, and printing them out on real paper (as opposed to that weird stuff most fax machines spew). I've never had much success generating hard copies of faxes received by my Mac. The NTX usually takes about ten minutes a page, though often as not, it gets bombed by a PostScript error before it ever prints. This hasn't happened yet with the NeXT. They print right away and every time. The best thing about faxing with the NeXT is that it can do all the page imaging in the background, rather than seizing the entire computer for the eternity this usually takes.

Preview. Allows you to view any PostScript file.

Icon. Allows you to view, alter, and create TIFF files.

Developer Tools. The NeXT is such an easy machine to write software for that the fact there isn't more of it indicates to me that cost of marketing is a far bigger factor than actually making the stuff. Aside from selling a lot more machines and increasing the market size, there isn't much NeXT can do about the notion that NeXT software doesn't pay. But they do certainly provide plenty of tools. These include:

Edit, etc. Edit is the ultimate programmer's editor, EMACS from heaven. It will edit and perform powerful search, replace, and formatting functions on any text or RTF file. If you're hidebound in your habits, though, NeXT also comes with EMACS, vi, ex, ed and the usual nasty UNIX editors. With Edit on board, I can't imagine why you'd want to use one of them though, unless you were logging into your NeXT from the outside.

Interface Builder. Stick a beautiful face and elegant handles on your code in minutes.

Compilers. C, Objective-C, and C++ compilers come with the machine.

Debuggers. Richard Stallman's famous GNU debugger, BUG-56 Debugger (from Ariel), Malloc Debugger, and AppInspector.

Tools. There is a whole Snap-On truckload of tool boxes for working on sound, music, PostScript, and other binary items which an end-user like me can scarcely imagine. Whatever you were trying to build, you'd probably be well equipped.

And finally... The NeXT comes with a folder stuffed full of cool demo programs, including a great flight simulator, a master chess game, Mandelbrot generator, neural net builders, file transfer software, a public key encryptor, etc, etc. There is also the full range of network administration tools, dressed up for ease of use (as if sysops cared).

THE COMPANY

Rather as you might expect, the company is a little eccentric. My first sense of the place was that they were all playing grown-up down there, but as I plumbed the depths of NeXT's humorlessness, it started to feel more like what you'd get if the aliens landed, wanted to assume human form, and had nothing to go on but *Gentlemen's Quarterly* and *ArtNews.* In other words, pod people by Armani.

But you can't argue with results. They could be aliens and undisguised at that. I wouldn't care. Whatever it takes for such a small organization to produce something so complex and yet so paradigm-warpingly great. The real question is whether they have a clue as to how to sell these marvelous things. There is plenty of evidence that they don't.

First they said they were going to sell them exclusively to college students. Then they said they were going to sell them to civilians, but only through the soon-to-be-deservedly-bankrupt Businessland. Now there appears to be almost no coherent sales program at all save the one which serves NeXT developers.

My sense of despair over the ability of NeXT to market its product properly grew during a conversation with a highly placed marketroid whose smooth-mouthed corporatisms were like a monument to Lack of Candor. This fellow's previous experience in the sober world of established computing had hardly prepared him to sell a machine so great that it makes people suspicious.

If they had a lick of sense, they really would take a page out of Michael Dell's, or, for that

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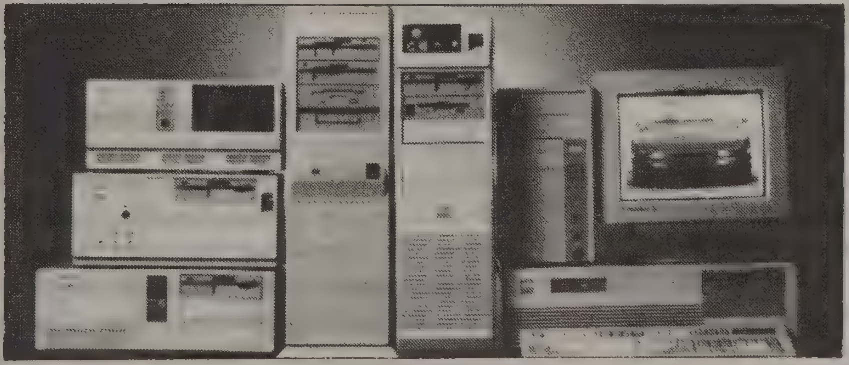

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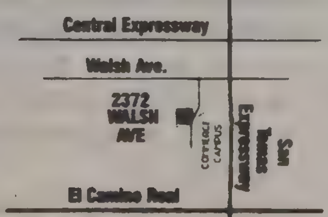

matter, Sun's, book and sell them over the phone. That's how I bought mine from Businessland, and those folks were even more clueless about what they were selling than the NeXT marketroid.

I suspect the reason they don't want to sell direct is concern over supporting a machine which is too powerful to be completely self-documenting. Or, worse, it could be Son of Apple Customer "Service." I guess the apples don't fall far from the tree, but some mistakes should not be made twice. And trusting *Businessland* to provide service on the NeXT is malignantly ill-advised.

After I bought mine, I started to scale the precipitous learning curve of a real UNIX box and immediately hit an overhang. I called NeXT for support. Where had I bought my machine? Businessland. All right, call Businessland then. So I did and was told that before they would support me, I would have to pay them $1,000!

"Whoa," I said, "Let me sample your wares before I plunk down that kind of money. If you can answer the questions I've got now, I might buy your support contract." After much negotiation, they agreed to this. Good thing I asked. They couldn't answer a single one. Indeed, the person I talked to seemed to know less about the machine than I did in my second day of owning it.

Then I had a moment of grace. I discovered BaNG (Bay Area NeXT Group) and its guiding Samaritans: Rick Reynolds, Robert Nielsen, and Dan Kehoe. Over the next month, I must have called these guys twenty times. And they were consistently helpful.

But I soon ran into problems even they couldn't solve. So I took another run at NeXT support, resolved to perform whatever manipulative acts of social engineering were necessary to get me through. I had to be shameless. It's easier to get an afternoon in the country with the Madonna.

But when I got through, I encountered the best support staff I've ever dealt with! These people are wonderful. Without exception, they are patient, resourceful, and very, very smart. They even seem to have a sense of humor. They go at my every problem as though the fate of nations hangs in the balance and don't quit until it's solved. And they appear to love both their company and their product with religious enthusiasm.

NeXT's support staff could be its ultimate secret weapon. If NeXT sold direct and offered everyone who owns one the kind of support I've received, they would be bigger than Sun in three years. Look at WordPerfect. I think that WordPerfect for the PC is almost unusably difficult, and yet it's the most popular software in the world. Why? Support. NeXT has the capacity to equal the Saints from Orem in the quality of their support. They should do it.

But of course a large burst of demand for NeXTs (such as I am so dedicated to whipping up) could create other problems for the company. One of the consequences of wanting to be on the bleeding edge of technology is that the market can change much faster than any but the most supple organization.

About the best reason for buying a cube instead of a pizza box is the recently shipped NeXTdimension board. This is a 32-bit accelerated graphics and video board which pretty well defines state-of-the-art.

Despite the awesome productive capacity of their Robot Factory, NeXT is already in an administrative scramble to meet the increased orders (more than half of them international) which have hit them since the first of the year. I know people who have been waiting for 68040 upgrade boards for four months. I keep thinking about something Jobs said at the first NeXT intro: "More companies die of indigestion than starvation."

THE CULTURE

Another reason to buy a NeXT is to experience the kind of community coziness and excitement which hasn't been seen around the Macintosh since about 1987. This culture is incredibly turned-on. Most of its adherents are young, smart, slick, and fashionable. In short, everything that I am not. Nevertheless, they seem not to mind having me around. Indeed, it also seems a very tolerant and inclusive culture. Maybe it's the color of the box, but the NeXT is the only computer I know where a significant number of the key developers are black.

Because of the ease with which one can create NeXTware, it seems to be developing a tribe of one- or two-person outfits who are turning out major programs, which, in their quality, ease of use, and general robustness, ought to embarrass the industrial giants like Lotus and WordPerfect who are also developing for the NeXT.

Furthermore, because of the object-oriented nature of the environment, I can imagine a proliferation of little and precisely purposeful soft objects being distributed by NeXTmail and paid for either electronically or in kind. Once there is a critical mass of machines out there, I believe things will happen much faster here than they did with the Mac.

Right now, the NeXT is about two years ahead of its competition. I think that between the quality of its developers, the ease with which they can both create and distribute their products, the incredible support they get from NeXT's developer "advocates," and the feverish state of their enthusiasm, NeXT software will sprint even further ahead.

HIMSELF

Probably not since the Tucker automobile has a machine been so thoroughly identified with a single human being as this one is. It is not possible to think of NeXT without thinking of Steven Paul Jobs, which is, in some respects, a blessing, but in larger part a curse. It is the only reason I can think of that these things are not selling like pet rocks at Christmas.

Bad-mouthing Steve Jobs is not quite as popular an indoor sport as bad-mouthing Bill Gates, but you can be certain it would be if Jobs were worth anything like $2 billion. Partly as a result of jealousy, and perhaps for better reasons too, most people in computing neither trust nor like him. He's hardly the first great visionary to suffer PR trouble, but there is something quite visceral about the reactions, pro or con, which he engenders.

In the wake of his dazzling demo, I said to him, "The only problem you've got now is getting people to believe in this thing." Or you, I might have added. "Yeah. That's our problem," he said, somewhat wistfully.

And it is. I have had people who are extremely well informed and situated swear to me that the new NeXT is, like its predecessor, mostly just show. They claim that NeXTstep 2.0 is fragile (it assuredly is not), that the '040 is still too buggy for general use (mine certainly isn't), and that the company won't make it anyway; so, even if the NeXT *were* insanely great, it would still be a black elephant.

I think NeXT will make it if there's an ounce of justice in the world. The company has earned success on the merits of its product, and, more to the point, so has Steve Jobs.

He may not be the world's greatest marketer. If he thought he was, he would never have hired John Sculley. But an unwillingness to focus his considerable intelligence on the dreary science of marketing is something I find it hard to fault him for. And I think there is a lot of long-term merit to what appears to be his guiding principle: *If I Build It (Right), They Will Come.*

He may also do a lot to destroy his own credibility. His enthusiasm for the first NeXT ran to a degree of overbilling rarely seen since the boy who cried wolf. His more recent claim of a 50% share in the "personal workstation" market is a further case in point. Figures don't lie, but this was a fairly transparent case of defining the terrain so you'll look big on it. As Guy Kawasaki said, "Why, if NeXT defined a market for *black* personal workstations, they could claim a 100% market share."

But to say he can't manage people, or that the computer they make for him is nothing but smoke and mirrors, is simply wrong. There is no one in this business (or perhaps any other) who can make a team burn with his own crazy sense of mission quite like Steve Jobs. And if you don't believe that, spend a day with a well-equipped NeXT and behold what a few people can do in a very short time if they've got the right mad hero charging along in the lead.

It's *insanely* great. ■

NeXT Month: The State of NeXT Software. Among the most damaging misconceptions about the NeXT is the notion that there is too little software for it. NeXT month I will put the lie to that, with mini-reviews of some of the powerful, diverse, and, in many cases, unique programs presently or soon to be available.

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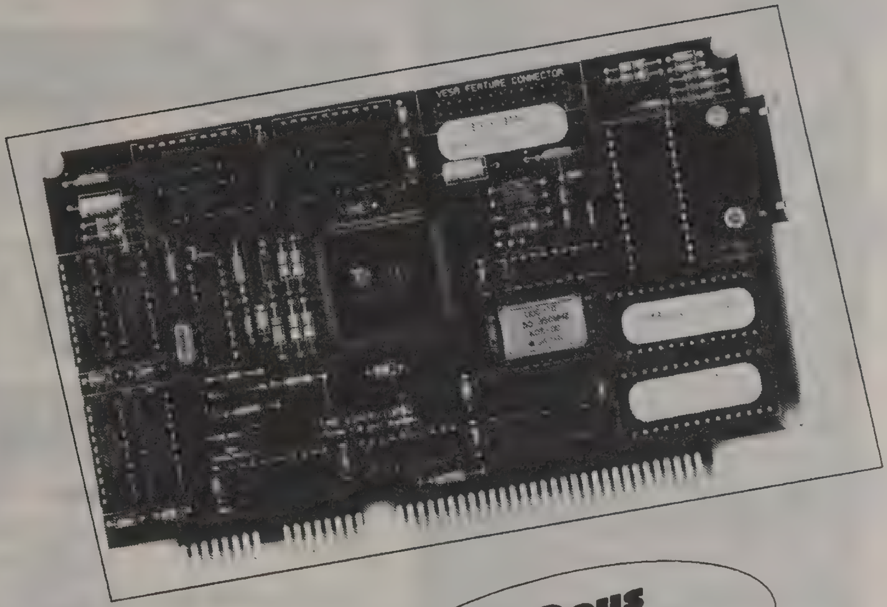

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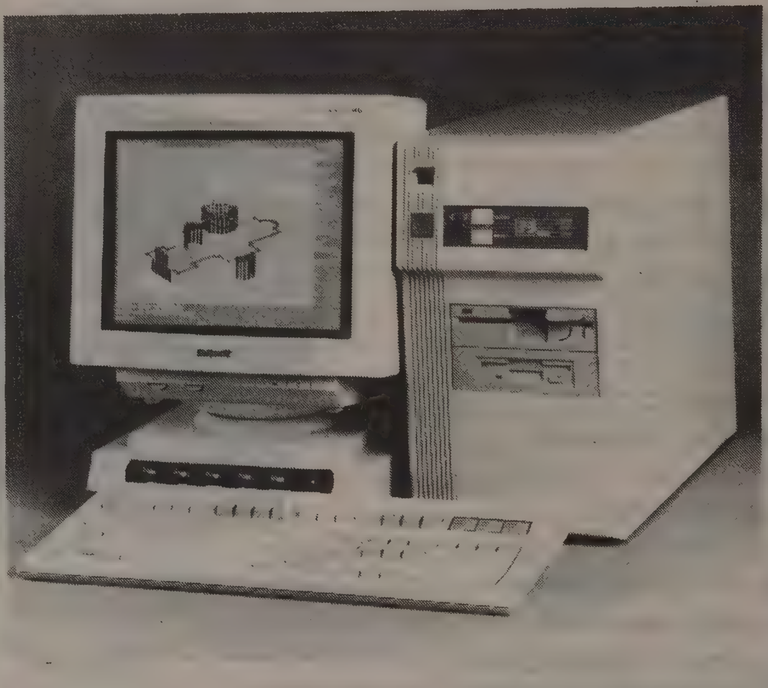

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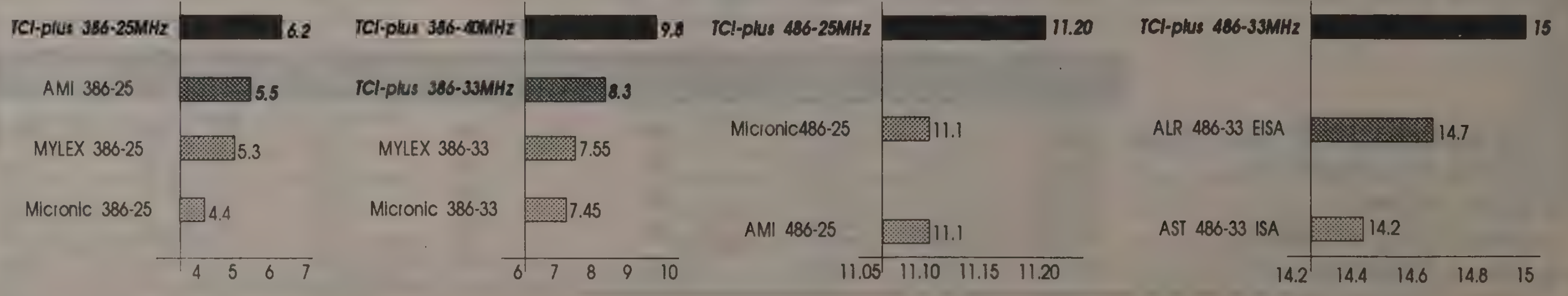

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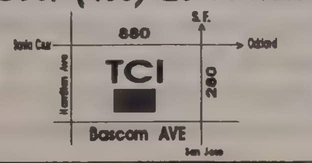

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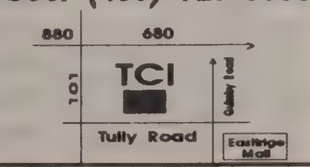

Making Life Simple With WordPerfect Office

Quasi-Multitasking And Other Productivity Enhancers

BY HARVEY OTTOVICH

With a background in electrical engineering, math, and business, I've encountered some complex problems and sophisticated solutions.

I'm also a firm believer in the KISS (Keep It Simple, Stupid) principle, which is why I've found WordPerfect Office an invaluable tool for managing the files and applications on my computer.

As you're probably aware, WordPerfect Corporation offers a full line of software tools: in addition to the WordPerfect word processor, there's the DataPerfect database, DrawPerfect graphics package, and PlanPerfect spreadsheet. Office, previously called Library, is an application linker that also offers many other features.

WordPerfect Office consists of a keyboard enhancer, calculator, calendar, editor, file manager, macros, mail, notebook, scheduler, and a versatile program called Shell.

With the latest version, 3.01, I can quickly navigate from program to program without exiting. This quasi-multitasking ability allows me to easily cut and paste information among various programs. I can suspend work in WordPerfect to start up the WordPerfect online manual. If I'm in Quattro Pro and need a financial formula, I can suspend Quattro Pro and start the Digital Learning Financial Mathematics Handbook. WP Office's screen copy feature allows me to copy a formula from this financial reference program back into Quattro Pro.

USING SHELL

Shell is the main navigational platform in Office, from which you can launch and control programs from a menu. Shell offers a uniform, easy-to-use interface that frees you from having to remember file names, paths, DOS commands and syntax, and the dozens of different launch commands for the various applications you may be running.

Time is indeed money. Why waste time repeating unnecessary keystrokes? It's much easier for me to press the letters "jwd" (from three menus) to start WordPerfect 5.1, Grammatik IV, and Definitions Plus!, than to change to the correct subdirectory by typing "CD" until I reach the desired location and remember the name of the batch file. I also use the TSR manager feature of Office to instantly load three writing tools; it allows me to run the TSRs and have them automatically removed from memory without rebooting.

Office is very useful if you're doing a real-time demonstration. We've all sat through demos where the presenter was struggling with the hard disk, looking for the right program. Recently I was demonstrating two video capture boards at a trade show; each board required separate software, and I also had to disconnect the video camera cable and connect it to the appropriate capture board. Using a menu I'd constructed in Shell, I would select A or B to run the right software, then make the appropriate cable connection. The process took less than a minute. Office allowed me to avoid wasting people's time while I embarrassed myself trying to remember where the demo program was on my hard disk. I was able to move quickly from application to application and show the important product features.

With Shell, I can create submenus to organize similar applications on one menu, for the same reason I'd create subdirectories to organize files on my hard disk. In Figure 1 you can see my main menu; if I don't like the way the menu's organized, I can move, copy, or swap menu items until I do. I can create title menu items with happy faces or other ASCII characters for emphasis.

I've also created a submenu for formatting floppy disks (Figure 2). With the advent of high-density formats on both 3.5" and 5.25" form factors, there's a lot to remember when formatting a DSDD diskette on a high-density drive. Now I just select menu item A, and I can format a 360K diskette on my 1.2MB drive. An additional advantage is that I no longer have to worry about mistyping a command and accidentally reformatting my hard disk.

FILE MANAGER

When I set up menu items, I sometimes need to know the path to a file. Organizing a hard disk in C, D, E, and F partitions/logical drives with nested subdirectories in the partitions creates nice, neat file storage, but also a new management problem. Enter WP Office's File Manager feature.

When I'm looking for a particular file and am not sure what subdirectory it's in, I use Find File in the File Manager. Once I've located the

Using WordPerfect Office, I can quickly navigate from program to program without exiting. This quasi-multitasking ability allows me to easily cut and paste information among various programs.

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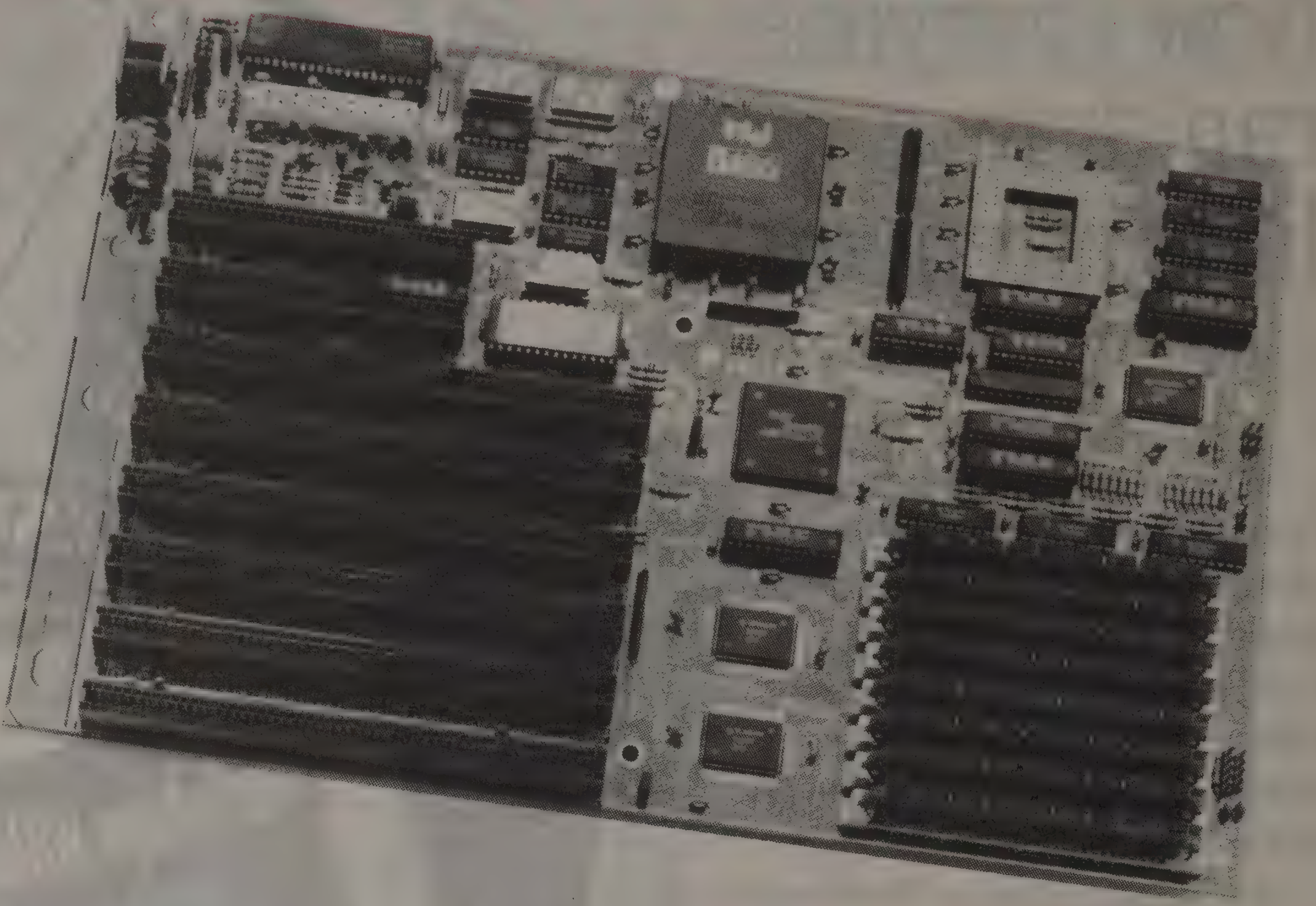
PAN486-25/33



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POWERMETER v1.3	11.01 MIIPS	14.66 MIPS
NORTON SI v5.0	54.1	72.1
QAPLUSv.4.21 (Whetstones)	4114.6K	5711.5K
QAPLUSv.4.21 (dhrystones)	15172	22758

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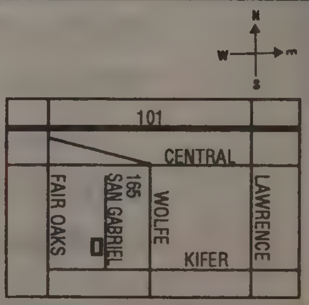
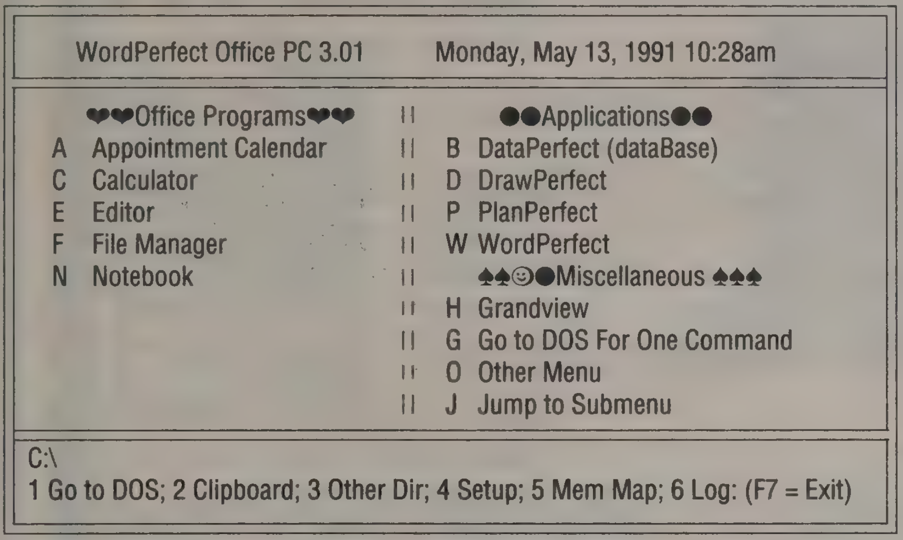


file, I highlight the subdirectory so it's listed on the status line in File Manager. Using Shell's screen copy feature, I copy the path name I need. Moving to the menu setup window, I retrieve and paste the path name into my setup menu.

When I create a batch file, I need file names and paths. Pressing "E" in the main menu wakes up the editor; alt-shift-F suspends editor and starts File Manager. Once I've used Find File and other features to locate the necessary information, I copy the information from the screen to the Shell clipboard. I exit from File Manager with F7, then press Enter. My cursor is right where I left it, ready to paste a path and file name into the batch file. Alt-shift-+ and it's done—drastically reducing the need to troubleshoot syntax or fix typing errors.



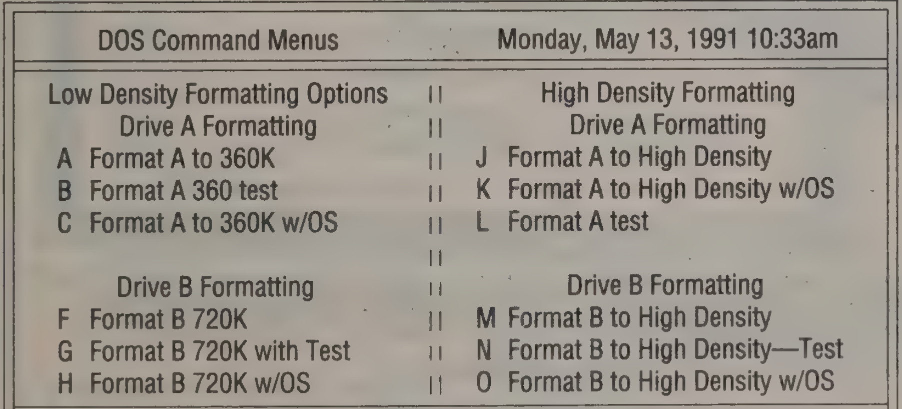
```
WordPerfect Office PC 3.01        Monday, May 13, 1991 10:28am

   ❤❤Office Programs❤❤       ||       ●●Applications●●
 A  Appointment Calendar      ||  B  DataPerfect (dataBase)
 C  Calculator                ||  D  DrawPerfect
 E  Editor                    ||  P  PlanPerfect
 F  File Manager              ||  W  WordPerfect
 N  Notebook                  ||     ♠♠☺●Miscellaneous ♠♠♠
                              ||  H  Grandview
                              ||  G  Go to DOS For One Command
                              ||  O  Other Menu
                              ||  J  Jump to Submenu

C:\
1 Go to DOS; 2 Clipboard; 3 Other Dir; 4 Setup; 5 Mem Map; 6 Log: (F7 = Exit)
```

Figure 1—The author's main menu in Word Perfect Office.

If I'm having trouble installing software where I want because its installation program will only load to a subdirectory off of root, it's File Manager to the rescue again. With a single keypress, I split the screen into right and left sections, one in tree-display mode and the other listing the files to be moved. I mark the files I want to move and press the move key (indicated in the function option prompts at the bottom of the screen). At the "Move/Rename To:" prompt, I press the tab key, and move the cursor to the desired destination for the files.



```
DOS Command Menus                 Monday, May 13, 1991 10:33am

 Low Density Formatting Options  ||    High Density Formatting
       Drive A Formatting         ||       Drive A Formatting
  A  Format A to 360K             ||  J  Format A to High Density
  B  Format A 360 test            ||  K  Format A to High Density w/OS
  C  Format A to 360K w/OS        ||  L  Format A test
                                  ||
       Drive B Formatting         ||       Drive B Formatting
  F  Format B 720K                ||  M  Format B to High Density
  G  Format B 720K with Test      ||  N  Format B to High Density—Test
  H  Format B 720K w/OS           ||  O  Format B to High Density w/OS

C:\
1 Go to Shell; 2 Clipboard; 3 Other Dir; 4 Setup; 5 Mem Map; 6 Log: (F7 = Exit)
```

Figure 2—Disk-formatting menu created by the author. No more accidental hard disk erasures.

But suppose there's no subdirectory there? With a few more keystrokes I can create one and move the files into it.

File Manager offers many other convenient options to insulate the user from the DOS command line.

BUT WAIT, THERE'S MORE!

WordPerfect Office includes more valuable features. The screen copy utility alone is worth the package's $149 price tag, and the repeat performance keyboard enhancer makes your keyboard a speed-typist's delight. The screen saver keeps lines from burning into your monitor's display when you forget to turn the screen off.

The appointment calendar keeps track of appointments, sends alarms when it's time to make a phone call or go to a meeting, and calculates the number of days between dates, all with a few keystrokes. It also lets you set alarms for project deadlines.

NoteBook is a flat-file database I use to quickly create separate address books for clients, personal and business phone numbers, etc. I've made each book an item on a submenu; I open the book with a keystroke and can quickly locate a phone number by first or last name, company name, or other criteria. Once I've found the number I want, I start the autodialer with F4, then pick up my telephone handset and strike the spacebar—nothing like an easy-to-use autodialer that frees me from pushing buttons.

I use the calculator program as a standalone and in conjunction with other programs—it's easy to perform calculations, then paste the result into a word processor or spreadsheet.

The editor program will be familiar to users of WordPerfect's word processor; it supports color and is much friendlier than EDLIN DOS.

With all these features and capabilities, WordPerfect Office makes it easy to manage your computer and its resources, and thereby get your work done more efficiently. ■

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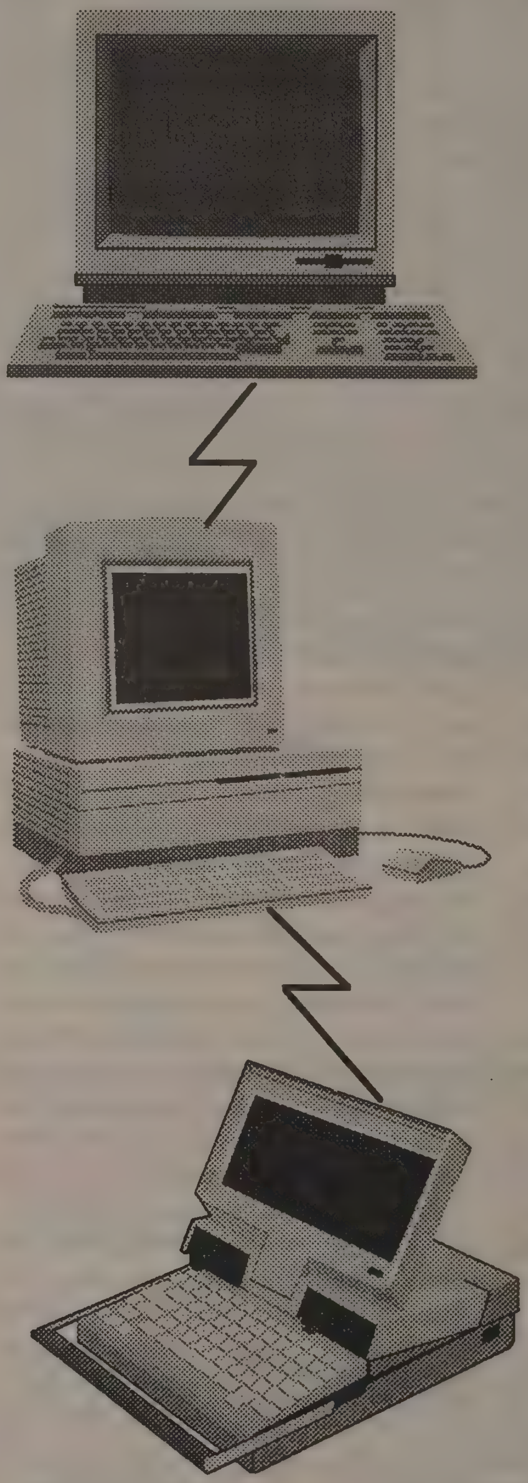

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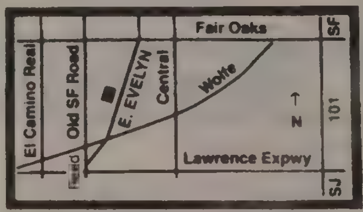

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Interactive Fax Makes Your Phone A Computer

Cost-Effective Communications, Customer Support, And On-Demand Information

BY BROCK N. MEEKS

My dad manages to coax the best tasting corn and tomatoes from the bleak, clay-hardened backyard soil of his suburban Concord home. No fertilizer, no chemicals. I ask him how he does it; he proffers only this simple answer: "I just plant it, weed it, and harvest it."

Given that simple explanation, it's not surprising that he also can't give you details about the mainframe database he taps into every day. "I just do it," he'd tell you. "It's no big secret."

Don't ask dad to tell you what MS-DOS stands for; he'd be utterly dumbfounded if asked to "double click on the desktop icon." But give him just two minutes, and he can produce a custom financial chart of the Dow's leading indicators, show you a mapped-out route through the day's rush-hour traffic, or snap off a glitzy report on the performance of the top twenty mutual funds. And that's just for starters.

He doesn't have a clue what a "database" is, nor does he care. And it's somewhat humbling that my dad can get that information faster and easier than I could ever hope to using my modem and online databases. And cheaper, too!

What my dad doesn't realize is that he's on the leading edge of technology. He's a participating player in a wonderful, transparent mystery: my dad's computer is his touch-tone phone. And through that phone he's able to access the ultimate "high tech/high touch" information system: "interactive fax."

THE INFO DUO

"Interactive fax marries the simplicity of the telephone to the popularity of the fax machine," says Joe Kowalczyk, president of Fax Interactive, an Atlanta-based company that specializes in the delivery of information via facsimile transmission. "Interactive fax allows anyone to dial into a database and select documents to be transmitted to their fax machine," he continues. "Picture it as automated document retrieval using your fax machine."

But this marriage is something of a *ménage à trois*; the two technologies are, by necessity, intimately involved with computer databases.

The whole system is so clever and "computer transparent" that even computerphobes like my dad are able to access sophisticated information services and receive hard-copy documents in a matter of seconds. Here's how dad works it:

He dials an 800 number voice line from his phone/fax (a cheap, "small-business" unit he bought at Price Club for around $400). A voice-response system greets him and asks him to "press one if you're calling from your fax machine. Press two if you're calling from a regular phone." He's then asked to enter his four-digit ID, then his four-digit password; the system verifies both and greets him by name, "Hello, Mr. Meeks. Press one if you'd like a copy of the latest on your stock portfolio now, press two if you'd like a later transmission of your stock portfolio."

Dad wants it now, so he presses one. The voice-response system acknowledges and informs him "when you hear the tone, press the start button on your fax machine." A second later dad hears the tone, presses the start button on the fax, and hangs up the receiver. In about seventeen seconds he gets Fax Ticker, a personalized printout of his stock portfolio's current worth. That printout includes a chart showing an up-to-the-minute index of thirty industrial stocks, a "Markets at a Glance" chart showing the Dow Jones averages, and a two hundred-word "Market Commentary" on the current state of the market.

All that information is real-time, except for his individual stock data, which is on a fifteen-minute delay. There's nothing faster around. Prodigy can't beat that, Dow Jones News Retrieval can't beat that. And there's certainly nowhere online to get this kind of printed, personalized, stock information this quick.

"We have a personalized template set up in a .PCX file that merges all the data from the online stock quote service and then sends it out via fax," says Kowalczyk of his company's Fax Ticker service. The printout is slick; it's formatted like a high-priced, customized newsletter. It's easy to read and impressive. Better still, "We can do this type of thing with virtually any kind of information," says Kowalczyk.

Phone-based computer communications are a multi-billion-dollar business, but there was a gap. "Interactive fax takes the vehicle of audiotex and fills a number of its limitations," says Kowalczyk. "Voice systems can't deliver graphics, can't deliver text. People that can't or won't write things down while listening to an audiotex system can now get that information in hard copy via fax."

The beauty of the interaction is that it's all done with the touch tones on the telephone keypad. How easy is it? I watched as an 8-year-old retrieved information for his homework from an interactive fax system.

"Documents are either scanned and stored on disk or are converted from their original file formats (text or graphic) to a fax format

"Interactive fax marries the simplicity of the telephone to the popularity of the fax machine," says Joe Kowalczyk, president of Fax Interactive, an Atlanta-based company that specializes in the delivery of information via facsimile transmission.

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Brock Meeks is based in Washington, DC; in lieu of tasting his dad's corn he now gets stock tips from his father, via fax, of course...

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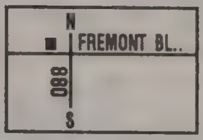

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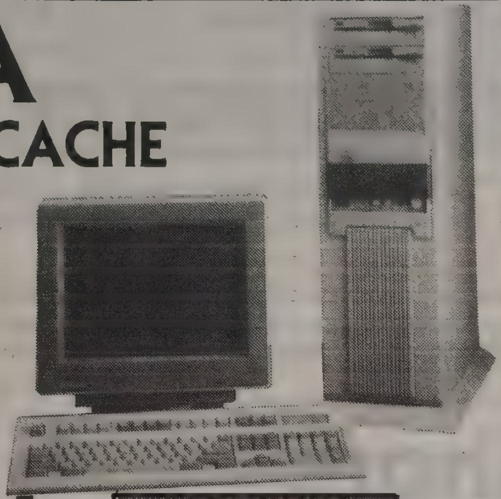

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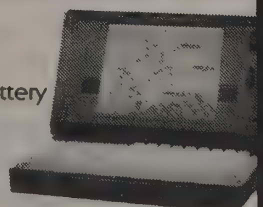

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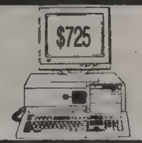

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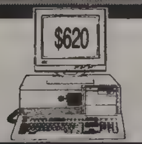

LANDMARK = 33
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LANDMARK = 21
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LANDMARK = 21
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- ☐ Real Time Clock w/Battery Backup
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286-12 MHz

LANDMARK = 16
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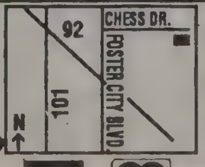

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file," says Chris Claudatos, president of FaxPump Systems, a Campbell, CA, company that makes the FaxPump, an off-the-shelf interactive fax system. "A computer outfitted with a voice board and fax board is the core of the system."

FAX BY TWO

Interactive fax is so new that the technology still hasn't gone through "buzzword shake-out"; it's also known by other names: fax back, fax on demand.

Brooktrout Technologies of Needham, MA, is largely responsible for marrying voice and fax into the "touch-tone response" system. The technique effectively turns the nation's 240 million telephones into computer terminals—a feat the videotex industry sees only in its dreams.

Interactive fax systems come in two flavors: same-call and two-call. Same-call systems operate like the Fax Ticker system described above: you get the documents faxed to you on the same call. A two-call system allows a user to call from any touch-tone phone, including cellular phones. The documents are selected and the fax phone number is entered. The user hangs up and the system sends the documents to the specified fax machine.

There are pros and cons for each type of system.

A same-call system is cheaper for the information provider; after all, it's the other guy's dime. Further, you could even set up your interactive fax service on a 900 number line and charge as much as the market will bear. On same-call systems, however, you run the risk of having your PC tied up while someone else is trying to call. "You're limited by the amount of fax cards and phone lines you have set up," says Kowalczyk. "And nothing turns off a customer more than a busy signal." Enter the two-call system.

Using a two-call system you avoid a large percentage of the busy signal problem. The caller hangs up after making the selection and your system then makes the fax call. If another voice call comes in, it simply waits to make the fax transmission, queueing up the fax requests until it can get to them. This allows more time for customers to call, but it also means that the fax transmission will be on *your* dime, not the customer's.

There's a way through the dilemma of choosing between the two systems: hire a "service bureau" to handle your interactive fax transmissions. Kowalczyk's company, Fax Interactive, is one such company. For a fee, Fax Interactive will store all your documents, create the voice-response menu and maintain the interactive fax system that sends out your company's information.

This route holds three prime advantages: First, using a service bureau, you are assured of having the latest technology work for you. "As the technology improves we upgrade our system," says Kowalczyk. Second, the service bureau offers many more incoming phone lines than your company could offer. "We've never had a client complain that their customers were getting busy signals," says Kowalczyk. And third, it's cost effective. Fax Interactive charges between $1500 and $2000 to set up an interactive fax service for your company. To match Fax Interactive's system in-house, you'd have to pay in the neighborhood of $3000 to $5000 per phone line.

FAX LITE

OK, suppose you're convinced that interactive fax sounds great, but you're only a *small*

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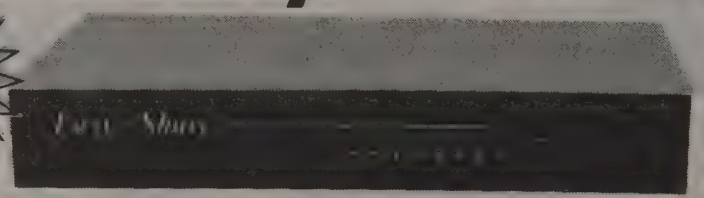

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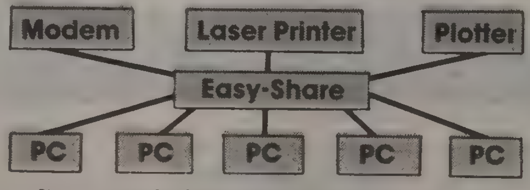

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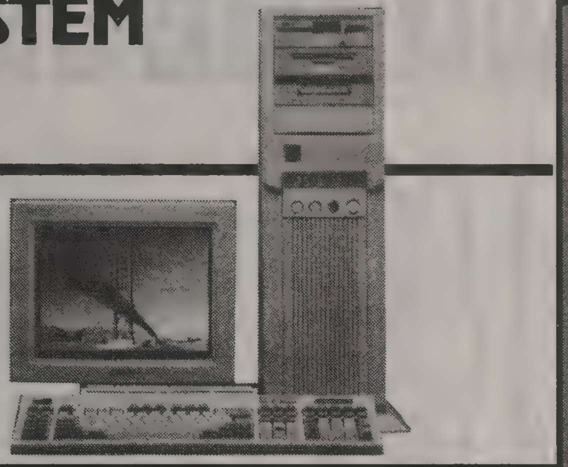

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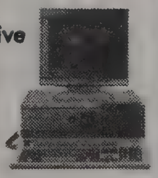

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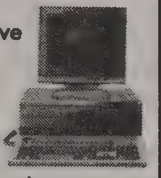

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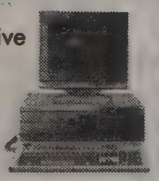

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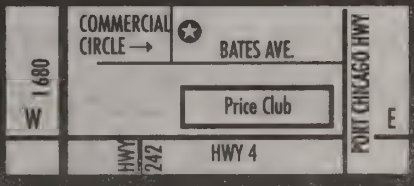

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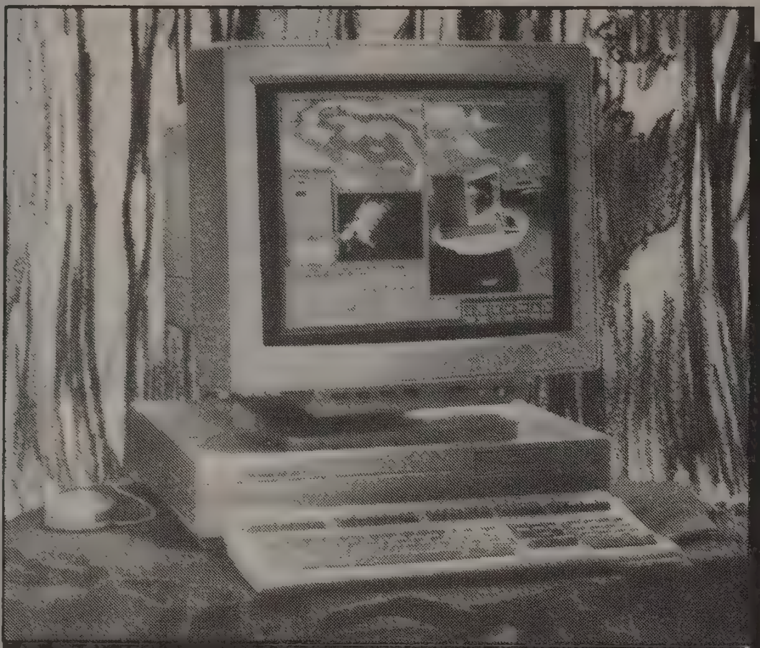

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small-business person. This technology isn't out of your reach. For just $1295 (retail) you can get a product called the FaxPump.

The FaxPump is a full-blown interactive fax system comprised of a voice-processing board and fax card. The system takes up two slots on an AT-class machine. And according to FaxPump's president Claudatos, the system can even be driven by an XT machine with a clock speed of at least 10MHz.

The system can support roughly one hundred different audio-menu selections on a 640K machine. Voice recording can be done with a remote microphone or with the telephone handset. The FaxPump can be configured to act as a same-call system or two-call system or both.

The list price of $1295 is for the *full system*; there are no hidden costs. This makes the system ideal for nonprofits wanting to jump into this technology (and they should). For those fearing the configuration and installation of the FaxPump, relax, it's easier than programming your VCR. If you can create a batch file, you can install the FaxPump.

TAKE IT AND RUN

I sat down for just a few minutes and came up with a page of possible applications for interactive fax. Here are a few of them. I'm sure you can think of more.

Public Information Center: Any agency or organization that provides information to the public. An AIDS awareness organization could have several of its brochures or information sheets available via interactive fax.

Government Organizations: Agencies could have the full text of pending legislation ready for faxing; a "10 Most Common Questions" menu could be set up to deliver one-page answers; the IRS could supply tax forms via fax; weather bureaus could deliver maps and extended forecasts.

Publications: Magazines or newspapers could offer instant reprints of popular articles or series of articles.

Customer Service: Provide easy "how-to" instruction sheets. A garbage disposal maker currently does this and claims that the system gets calls at all hours of the day and night. It makes his company "accessible twenty-four hours a day," and it frees his small staff from answering phones all day simply to answer the same basic questions.

Provide a map to the store. "Every company should have interactive fax if just for this use," says Kowalczyk. "Imagine how many more customers would visit an establishment if they could simply push a button and have a customized map faxed to them." Or give directions from the airport, etc.

Provide instant product information in the form of both graphic and text. This shortens the turnaround time when a customer requests more information from weeks to minutes.

And of course, I would be remiss if I didn't point out the application that makes most of the manufacturers of these systems wince: interactive porno-fax. Dial a 900 number sex chat line, and at certain, ah, "intimate" moments you could have a system set up that would say: "Press one now for your picture of ..."

Such are the fax ... so to speak. ■

RESOURCES:

Fax Interactive
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PC Scanning And OCR On A Budget

The State Of The Art Still Isn't What We'd Like It To Be, But Caere's Typist Offers Good Accuracy And Ease Of Use At A Bargain Price

BY NICK ANIS

PC-based optical character recognition (or OCR) has come a long way since its disappointing introduction about five years ago. One very expensive product I found nearly worthless at that time comes to mind—one of the first OCR products for the Apple Macintosh.

There were many delays in this product's release and when it finally came out, it was buggy and cumbersome. Back then there were five of these programs that "kinda worked," as long as you expected to do no more than experiment with them. But if you actually wanted to scan several pages of text, these products did a lousy job. Sometimes they would produce whole pages of random characters. Even working at their best, they suffered from all sorts of annoying errors, misreads, bugs, and glitches.

Since then, OCR products have improved to the point where some of them have been given editor's choice awards, but ten to twenty errors per page are still commonplace.

The biggest problem is that OCR software still requires a lot of skill to use; it's not automatic enough. Getting a scanner and OCR software to work together requires some trial and error. You need to learn how to "tune" the light and dark settings, know what typefaces will be recognized, and develop a sense of what section in a document will fit in the scanner's range. In other words, you'll have to work at it a while before you can expect to scan whole pages without too many glitches.

Once you've acquired the right knack, the results can be quite impressive. Some OCR service bureaus have gotten it down to a science, to the benefit of users who can't scan an unglitched sentence even from a perfectly typeset original. Paying someone else to scan text for you is more expensive, but will save you the frustration of starting with text like "this is a very solemn sentence" and getting something like "thiss sa berry solomon send tense" out the other end of the OCR pipeline. Problems like these can end up making you wish you'd retyped the document manually.

One reason for the steep learning curve and disappointing results is computers don't read the way people do. Recognizing an alphabet of various sizes and typefaces is a complex process, and plenty of other things can go wrong too.

Here's an example. I'm not much of an artist, in fact, I can't even draw a straight line. And it showed when I first used the Typist OCR system. The image file created of the document I scanned was skewed, the hand-held scanner equivalent of a curve ball: I had rotated my arm just a bit while passing the scanner down the page. This would be enough to throw off most OCR systems, but the Typist software managed to recognize the text almost perfectly. (More on this later.)

Twisting the original isn't a problem on flatbed scanners, but they cost a lot more and aren't well suited for scanning directly from a book or magazine. A hand-held scanner, like the Typist, lets you scan individual columns of text, magazine, or book pages without having to make photocopies first or tear out pages.

The best bet for most users is probably to get a hand-held scanner first, then a flatbed scanner if you need and can afford it.

IN SEARCH OF GREAT OCR

Not many OCR products have had favorable reviews, but one is Caere Corporation's Omni Page Professional. Omni Page is an established, reliable, and stable product. Although it doesn't directly support all the low-end scanners, it can process popular image file formats that have been created by any scanner that produces adequate resolution.

Its $895 list price has discouraged some people. The system requirements—386-based PCs with 4MB of RAM running under Windows 3, or a Macintosh with 4MB of memory—limited the program's appeal for others. There *is* a 286-based version of the product, but it requires Caere's expensive, proprietary memory card in addition to the software. (That's a measure of how complicated OCR really is.) But 386-based systems with 4MB, running Windows 3, are getting more common, which has broadened the appeal of the Omni Page Professional 386 version.

THE PRICE BARRIER

The Omni Page program's continuing appeal has proved the market exists, and it seems time to take the next step. There's no doubt about it—a lot of users are looking for an accurate and reliable hand-held scanner with OCR for a couple hundred dollars or less.

They won't find one yet. Although prices are coming down, these

> **A lot of users are looking for an accurate and reliable hand-held scanner with OCR for a couple hundred dollars or less. They won't find one yet. Although prices are coming down, these products lack needed features or software.**

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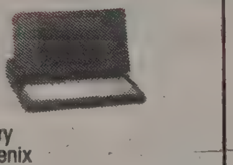

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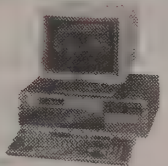

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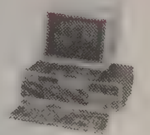

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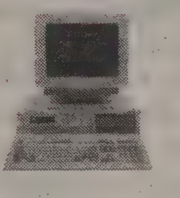

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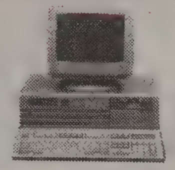

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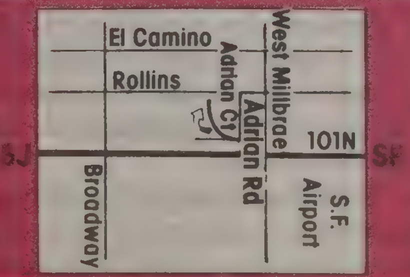

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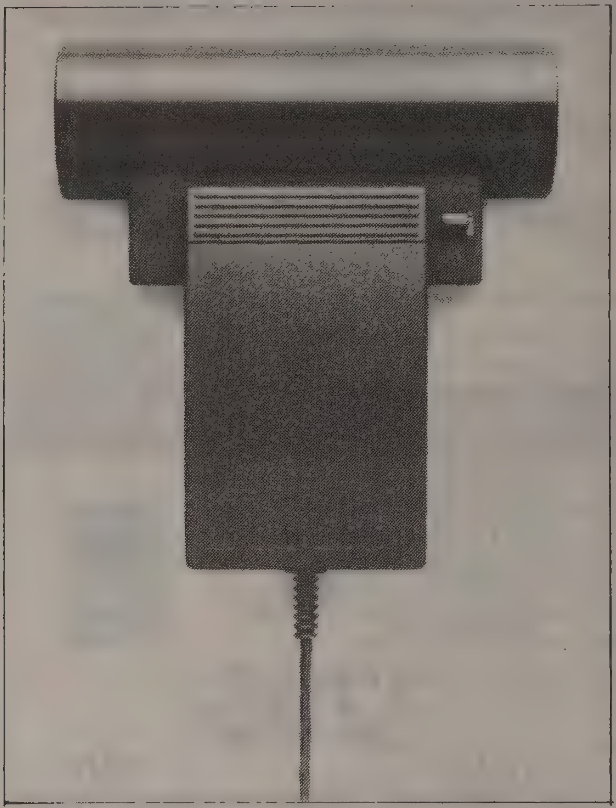
products lack needed features or software. But market leader Caere now offers a new hardware/software hybrid OCR product called the Typist. It's priced aggressively at $595, and is worth a good look.

The Typist is a hand-held, 400-dot-per-inch scanner that comes with bundled Omni Page-based software. The street price for the Typist is about $475, substantially less than the Omni Page Professional's $895 list; unlike Omni Page, the Typist includes a scanner too.

The Typist costs more than Logitech's entry-level, hand-held scanner (street price around $180), but is much better suited for OCR because OCR is its primary focus. It also supports image scanning, but that's not why someone would buy it. Competing products are designed to produce images and may support OCR only as an afterthought or as a separate option. The Typist has the distinction of being the only hand-held scanner designed primarily for text recognition.



If you're working with 10- to 20- page reports, flatbed scanners are more practical. But they cost from $1,000 to $2,000, and generally don't include OCR software, which must be purchased separately. At the other end of the price spectrum, you can't find good OCR software that directly supports low-end, hand-held scanners. OCR software that works properly doesn't come cheap. At around $475, the Typist, a complete package, is probably the best value around.

It really is a complete package. The bundled Caere software includes both Windows- and DOS-based programs that, by themselves, are worth the price of admission, even without any hardware. But you also get a 400-dot-per-inch, hand-held scanner designed specifically for OCR. And you get image scanning into the bargain.

TYPIST CAPABILITIES

The Typist is targeted for users doing research who need to take data out of books and articles. It can handle both text and half-tone images, and the software provides various types of image dithering. Or you can save your scans to disk and process them using any third-party software you choose. There are plenty of graphics programs out there to massage images, if Typist's image-handling options don't fill all your needs. And Typist supports both Windows and DOS—which is not at all common.

Both the DOS and the Windows versions are accessible from within applications: you can scan text directly into applications you're running. Typist's OCR software will recognize and transfer text directly into the file you are working on with an application, as if you had typed it at the keyboard. Both Windows and DOS versions have options for merging text and for handling carriage returns and line feeds. There's even an option that handles columns of numbers for entering data into spreadsheet cells.

Windows mode gives a real-time, bit-mapped representation of the scanned image. You can use this view to decide whether your settings are too light or dark, check whether the text is merging correctly, or identify other problems that would ordinarily be difficult or impossible to identify.

Viewing the scanned image will also tell you if the scan was uneven. Uneven scans are common and can happen if the surface you're working on isn't stable or if you don't make a smooth, straight pass over the document with the scanner. The scanned image view helped me discover I was twisting my hand to the left as I scanned. The resulting image was a bit out of whack, though not too much for Typist to handle.

If the scans you do are even less straight than mine, Typist will tell you when the image becomes too crooked. The red LEDs that make up its scanning light bar will begin to flash. The same is true if you pass the scanner over the image too quickly. You can go fairly fast without overfilling the buffer, but if you overload it the LEDs flash. With feedback like this, it doesn't take long to get the hang of using this device.

Scanning text with the Typist is a single-step process that feeds the scanned material directly into your application. Squeezing the scanner's trigger calls the Typist software into action and it starts reading the document. Once the trigger's released, the software quickly analyzes the text and suddenly your application thinks you're typing at the keyboard, ten-dollar technobabble words and all.

I found the Typist to be very accurate although it can make mistakes—especially if you don't have things set right, or the original isn't that good. Using a spell checker with Typist is, of course, a good idea.

When you compare the single-step process of Typist use with other OCR systems that require two or three steps, Typist really stands out from the crowd. Other systems separate each step, making it an awkward and frustrating process. You have to scan an image, save it, call up your OCR program, and translate the image into ASCII characters with, usually, poor to mediocre results. You'll probably have to do a great number of corrections. And reading the ASCII translation into your application may be a completely separate procedure involving file imports and reformatting.

While some of the more advanced OCR software will simplify this tedious process, sometimes by combining image scanning and OCR, only the Typist does it all in one shot.

AND THAT'S NOT ALL...

Every time you need a different capability, it seems like Caere's anticipated your need and already put the feature in. Try Typist, and you'll see what I mean.

For example, would you believe that Typist even supports foreign alphabet characters? This feature will be a great help for users who work with multiple languages. Typing can get tedious enough without having to key in characters that are absent from the default keyboard. Anyone who has tried to use the DOS national "code page" scheme for handling international characters will appreciate how useful the multilanguage features are.

The image scanning works well too. As with other scanners, the line art setting works best for OCR, while various ranges of half-tone settings, with different dithering patterns, work better for half-toned images. Picking the best range and pattern is a task that hasn't yet been automated; it may never be. The right choice depends on the condition of your original, how balanced the image is, what printer you're using, and other variables that are beyond the manufacturer's control. Here's where your good eye for art (and the patience to do some trial and error attempts) will pay off in the final result.

If your PC has devices that may conflict with a scanner, you shouldn't have to worry with the Typist. The PC version has an interface card with four dip switches that change the card's port addresses if necessary. The choices range from 140H to 1F0H. Most users won't have to worry about this at all; few, if any, devices use this address range, so conflicts are not likely.

Not that Typist is completely conflict-free—some initial conflicts were reported with certain SCSI drives, which Caere has fixed. In fact, I didn't have any problem on my system with my SCSI drives.

If you want an easy, flexible way to scoop text directly into your favorite applications, the Typist is a good choice. While the product may take a little getting used to, once you've become accustomed to using it, you'll wonder how you ever got by without one. ■

RESOURCES:

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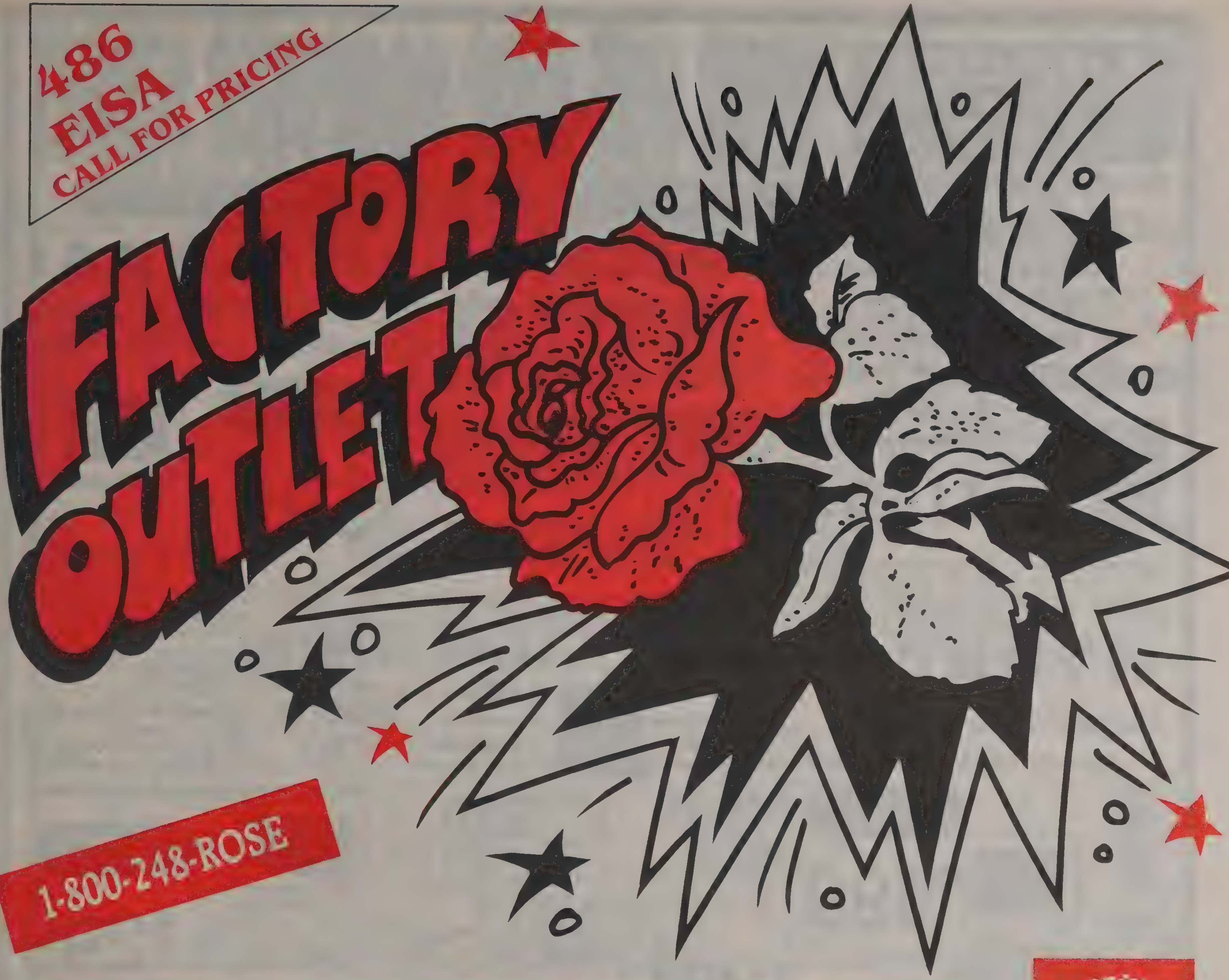

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• MS/DOS 5.0 add:	$89
• MS/DOS 3.3 or 4.01 add:	69
• MS/Windows & Mouse add:	99
• TEAC 1.44 Floppy Drive add:	67
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All Systems Include: •1MB RAM (expandable) •TEAC 1.2MB 5 1/4" Floppy •IDE 2/Floppy 2/HD Adapter •2 Serial, 1 Parallel & 1 Game Ports •Desk Top Case •200 Watt Power Supply •101 Key Keyboard •Assembled & Tested

Video & Hard Drive Package

	14" Mono	14" VGA Color	14" SVGA Color	14" UVGA Color
40MB	$339	$549	$629	$789
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140MB	609	799	919	1039
210MB	819	1029	1149	1269

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(Monitor & Adapter)

• 14" Color VGA 640x480	$329
• 14" Color SVGA 1024x768	449
• 20" Color SVGA 1024x768	1659
• 14" Color UVGA 1024x768 (Non-Interlaced)	569
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• 210MB Seagate ST1239	675
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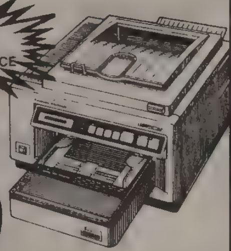

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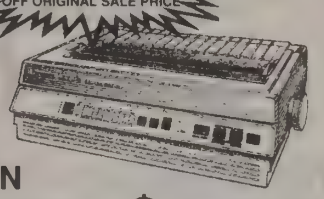

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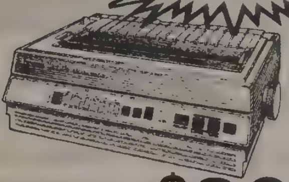

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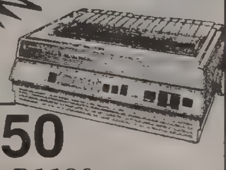

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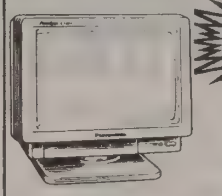

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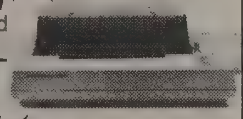

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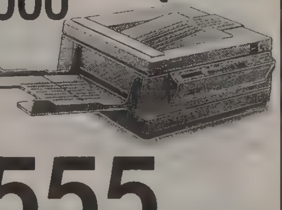

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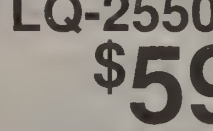

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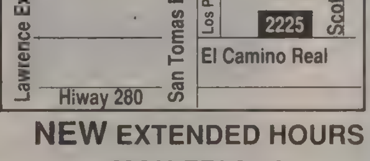

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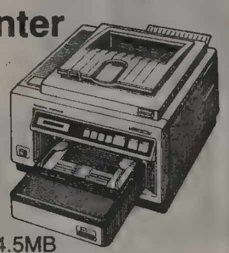

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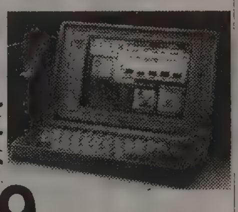

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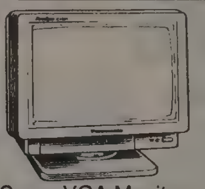

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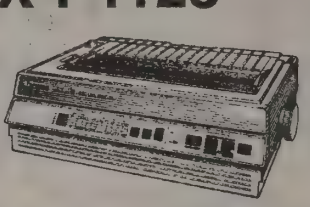

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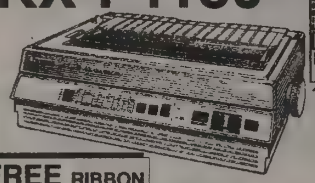

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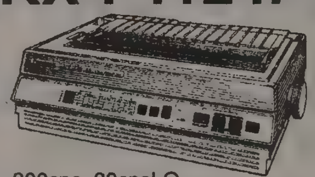

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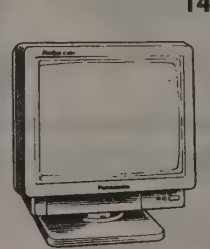

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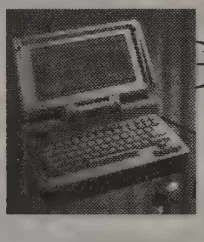

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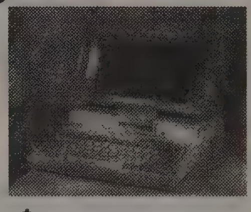

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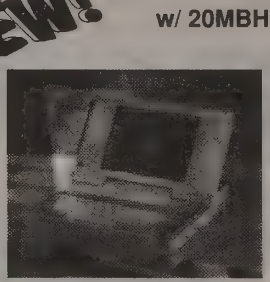

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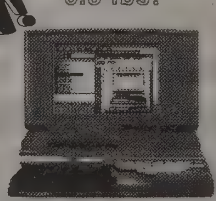

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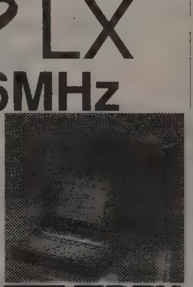

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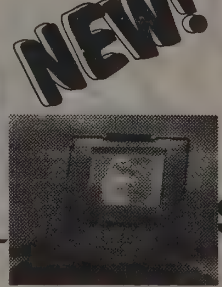

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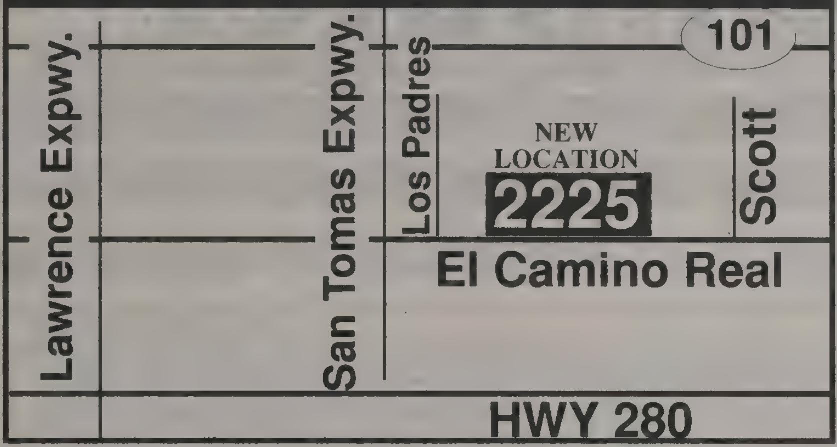

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Your First Computer

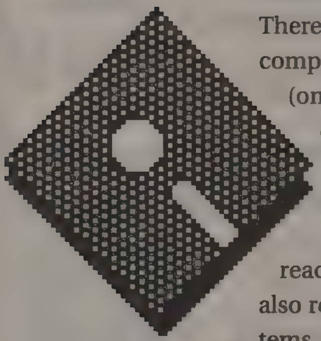
Everything You Never Wanted To Know About Floppy Disks

BY MIKE MARKOWITZ

Floppy disks look alike, but there are different and incompatible disk formats in common use. "Formatting" is a pattern of magnetic tracks and sectors written out by the disk drive when a new disk is "initialized."

If a particular computer can't read your disk, the cause may be a format incompatibility. If no computer can read your disk, the disk may be damaged. There are excellent commercial utility programs that can attempt to recover files from damaged disks, including Norton Utilities for IBM PCs, SUM II or Norton Utilities for the Macintosh, and Copy II Plus for the Apple II.

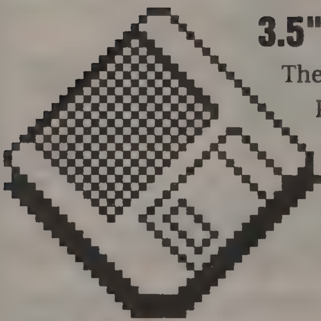
5.25" (BLACK VINYL) DISKS



There are two common formats for floppy disks used in IBM PCs and compatibles. "Double density" disks are formatted for 360KB of data (one KB or kilobyte represents 1024 characters). High-density disks are formatted for 1.2MB or about 1200KB of data. You may see double density disks labeled as 48TPI (tracks per inch), while high-density disks are labeled 96TPI.

Older IBM PC and PC-XT 5.25" floppy disk drives can only read and write the 360K format. Apple makes a 5.25" drive which also reads this format; it can be connected to some Macintosh systems. IBM PC-AT and later PC compatible systems use high density 5.25" disks, and 360K drives cannot read such disks. Some high density drives cannot reliably write or format 360K disks, although they can read this format.

3.5" (HARD SHELL) DISKS



There are two common formats for 3.5" floppy disks used in IBM PCs and compatibles: low-density (720KB) and high-density (1.44MB). High-density disks are distinguished by a small square "notch" or hole punched in the upper left corner of the plastic shell. They are also stamped with the HD symbol:

HD

To format an MS-DOS 720KB disk on a high-density 3.5" drive, type:

```
format a:\n:9
```

APPLE II DISKS

Apple II 5.25" floppy disks hold about 140KB of data. There are several incompatible disk formats. Older Apple II programs use Apple DOS 3.3, while newer ones (since about 1986) use Apple ProDOS. Some kinds of data can be converted from one format to the other, but many older Apple II programs are copy-protected in ways that make this impossible.

Almost all 3.5" disks for the Apple II and IIGS use the 800KB ProDOS format, which can also be read by the Apple File Exchange utility program on a Macintosh.

Copyright © 1991 by Mike Markowitz. All rights reserved. Mike Markowitz is a computer user support specialist for a large Southern California university. He has been writing about personal computing since 1984.

MACINTOSH DISKS

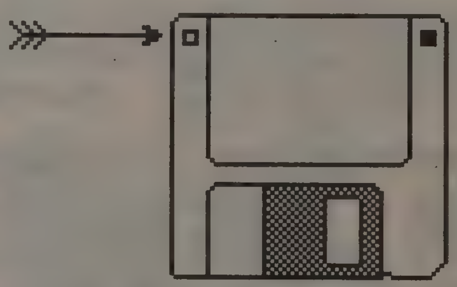
There are three Macintosh 3.5" disk formats. Older Mac programs (before about 1986) often use "single-sided" (400KB) disks; this format is obsolete, but all Mac disk drives can read it. Most Mac disks are "doubled-sided" (800KB). Beginning in 1988, Apple introduced the "SuperDrive," which can format high-density disks (1440KB). Some computers that have this drive are labeled FDHD, which stands for "Floppy Disk, High Density." This drive can read and write the formats used by 3.5" floppy disk drives on IBM PCs and compatibles.

To format a blank disk on a Macintosh, simply insert it into the drive.

Macs and PCs differ in the way they treat "bad sectors" on a disk. "Bad sectors" may be manufacturing flaws, microscopic dirt particles, or physical damage to the disk surface. On PCs, the MS-DOS operating system marks bad sectors as unavailable. On Macs, a disk that contains any detectable bad sectors is ejected with the message "Initialization Failed!" Sometimes you can salvage such a disk by reformatting it as a single-sided (400K) disk—if the bad sector is on the "other side"—but it is safer to simply discard it.

You should not use high-density disks in any Macintosh drive that is *not* high-density—800KB Mac drives cannot detect the special notch that identifies high-density disks, and will attempt to format them as 800K disks. A Mac with an FDHD drive will not recognize such a disk correctly. The magnetic coating on high-density disks is thinner and has finer particles than the coating on ordinary disks. High-density disks are ruined when they are formatted as lower density disks on a Mac—you risk losing any data saved on such disks.

In an emergency, you can fool a high density drive into recognizing a high-density disk that was formatted at low-density. Simply cover the square hole in the upper left corner of the disk with a piece of tape or a press-on label (firmly enough so that it will not come loose and jam the disk drive).



ABOUT VOLUME NAMES

The MS-DOS operating system allows you to name a disk . This is called a volume name—it is limited to eight characters, and serves almost no purpose, since MS-DOS refers to disks by the letter of the drive they are in. On the Macintosh (and the Apple II under ProDOS), every disk must have a name—the Mac assigns the default name "Untitled" unless you type something else. If you cannot think of a more descriptive name (like "Client Proposals," or "Jennifer's Thesis"), I suggest using the month and year as a volume name, since this

Continued on page 137

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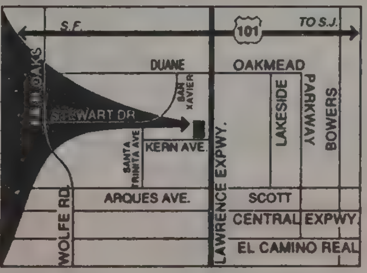
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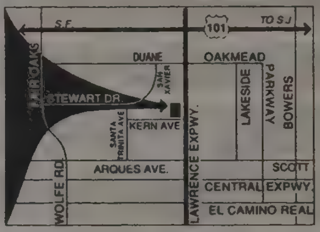

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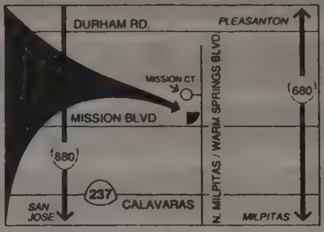

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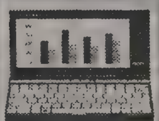

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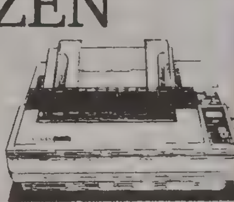

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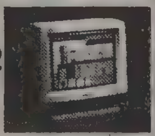

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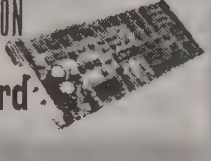

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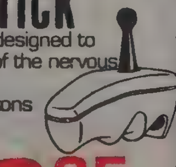

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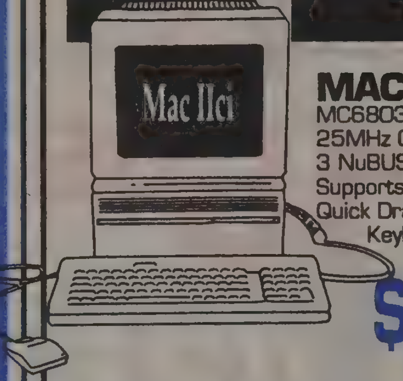

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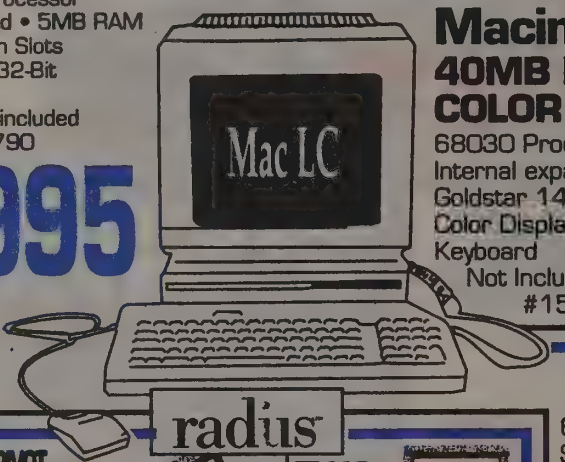

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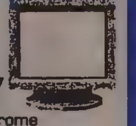

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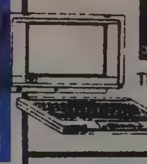

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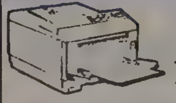

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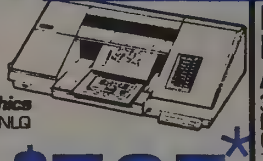

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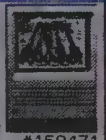

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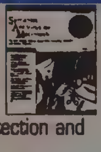

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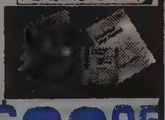

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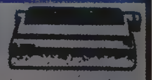

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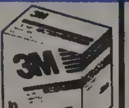

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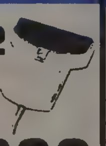

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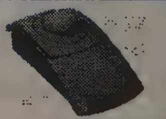

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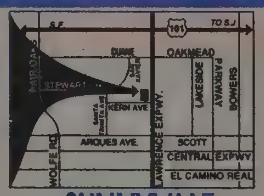

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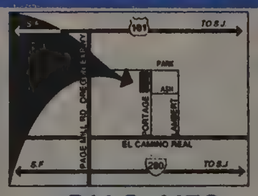

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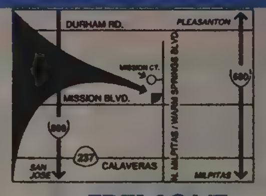

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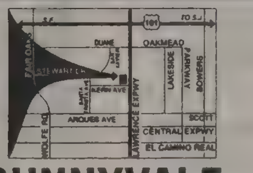

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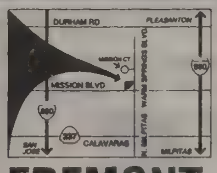

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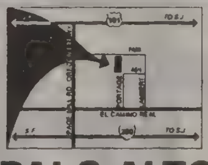

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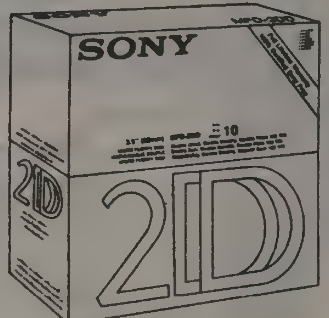

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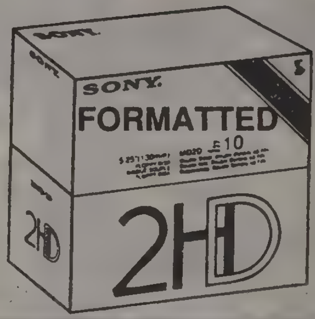
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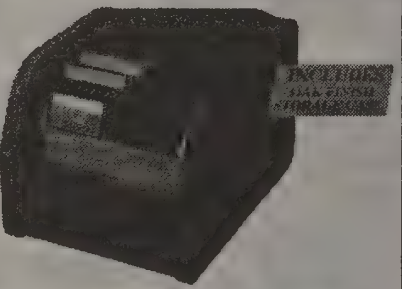
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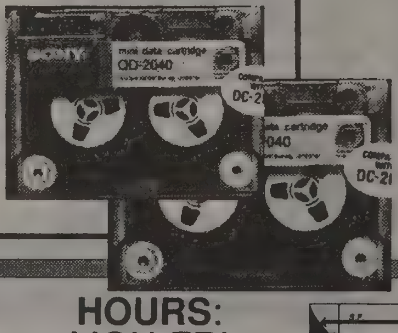
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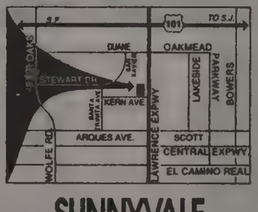
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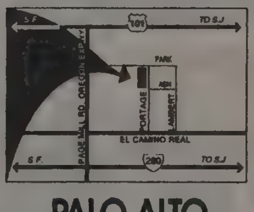
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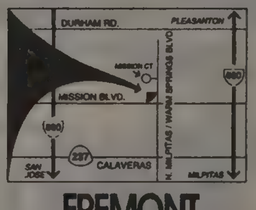
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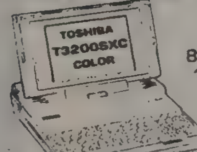
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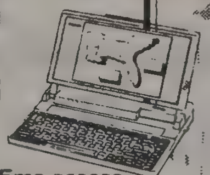

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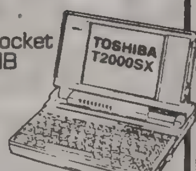
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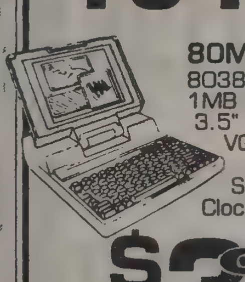

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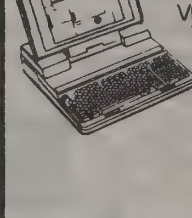

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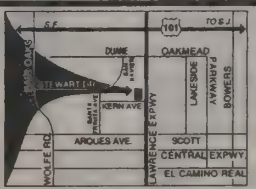
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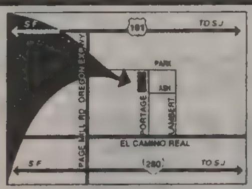
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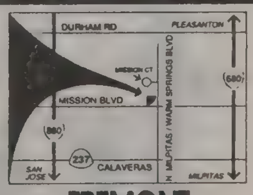
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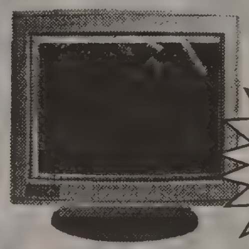

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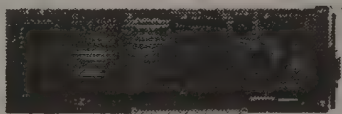

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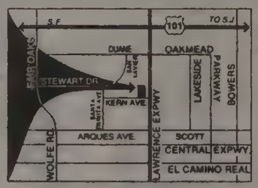

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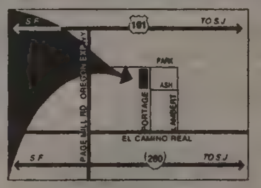

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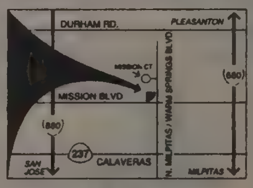

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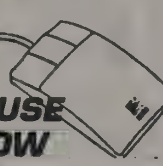

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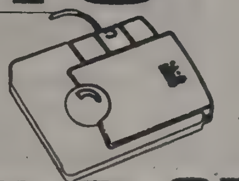

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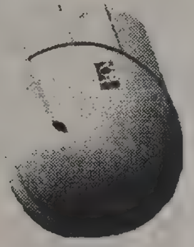

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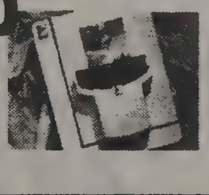

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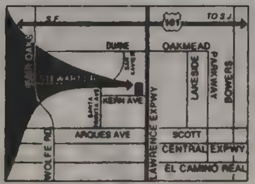
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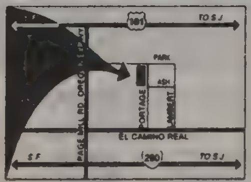
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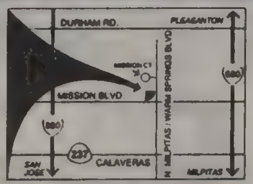
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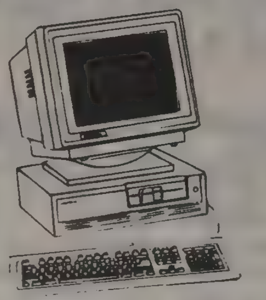

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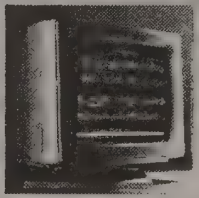

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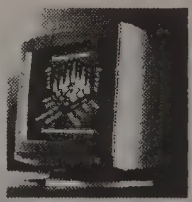

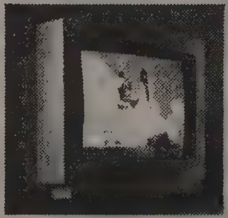

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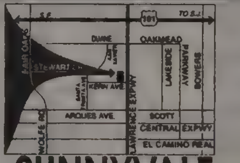
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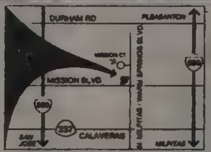
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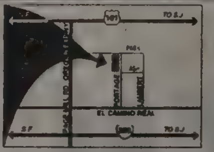
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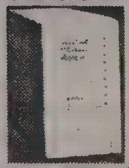

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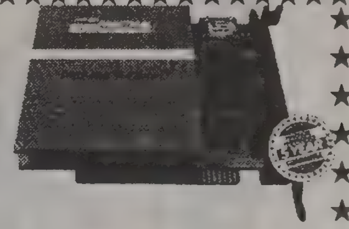

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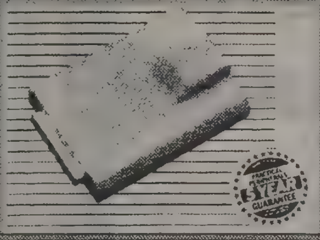

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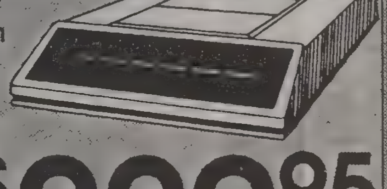

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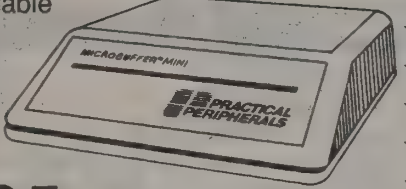

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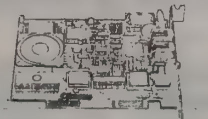

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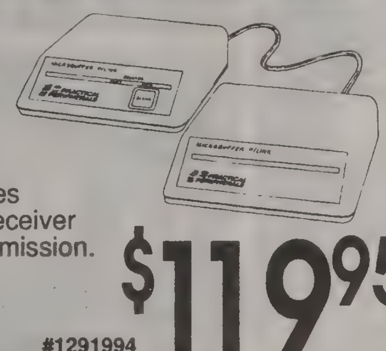

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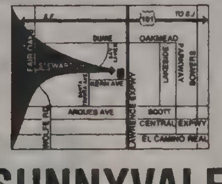

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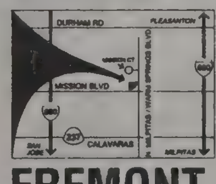

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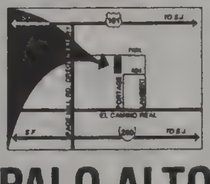

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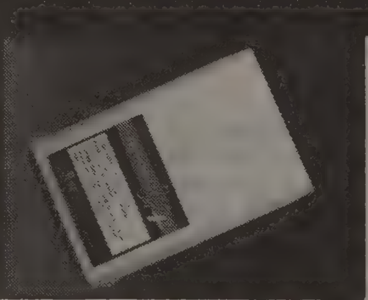

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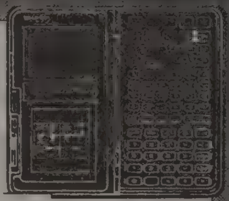
SHARP Wizard

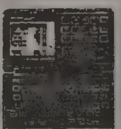


Fry's electronics proudly presents the Sharp Wizard! This amazing Personal Organizer has everything you need to put a world of information at your fingertips. The unit comes equipped with a calendar, appointment book, memo pad, world or local time clock and a 32,000 character memory to store it all! Plus, you can interface information directly from your Macintosh or IBM computer and print information directly from your wizard. There is also a variety of software available to use with your sharp wizard... Everything from a dictionary, money planer, spreadsheet, 8-language translator and games All of this and more for only...

$238

Model 02-7200
#1604737

SHARP PERSONAL ORGANIZER

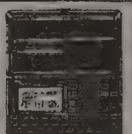


This amazing Personal Organizer has everything you need to be organized. This unit has a full-touch keyboard, three telephone directories, personal scheduler, world time clock, memo pad and an option port that allows you to talk to other Sharp Personal Organizer. The unit comes equipped with 64,000 character memory. Get this hot new unit from sharp for only...

$188

Model ZQ-5200
#1604715

SHARP PERSONAL ORGANIZER



This new Personal Organizer from Sharp will get you organized for less, much less. This unit boasts three telephone directories, personal scheduler, memo pad and calender. This unit also has an option port that allows you to taly to other Sharp Personal Organizers. All this for the hot low price. of...

$99

Model ZQ-2200
#1604689

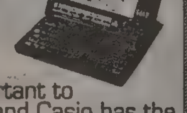
CASIO DIGITAL DIARY

Why carry around a calendar and schedule book, telephone directory and notebook, when you can do it all and more with this new digital diary from Casio.

$74 95

Model SF-4100
#1555592

CASIO ELECTRONIC ORGANIZER

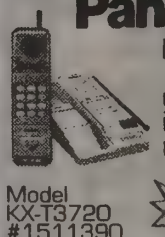


B.O.S.S In today's world it is so important to remain organized, and Casio has the 90's answer to this problem. With this electronic organizer, you can keep notes, telephones numbers, plan your calendar and more!

$239 95

Model SF-9500
#1531167

Panasonic 10-CHANNEL CORDLESS PHONE



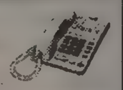
Panasonic's Advanced Sound Changer technology and 10-channel access sharpens mobile sound quality! This unit has enhanced battery standby life, automatic intercom, 2-way paging, a 10-number memory and last number redial.

10 CHANNEL

$89 95

Model
KX-T3720
#1511390

Panasonic SPEAKERPHONE

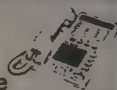


For the office or home, this phone has all the features you need. It has a speakerphone, 28 station automatic dialer, automatic redialer and much more.

$39 95

Model
KX-T2315
#1530100

Panasonic 2-LINE SPEAKERPHONE



Don't settle for less than the best for your office, Get Panasonic. This Hot unit allows conference calling from speaker phone, Automatic Dialing, Automatic Redialing, a K-Size handset and much more.

$67 95

Model KX-T3145
#1402205

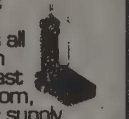
AT&T 10 CHANNEL CORDLESS PHONE WITH CLARITY PLUS

AT&T's top of the line cordless phone with dialing on the base, and clarity plus is in stock now for only . . .

$169

Model
5500
#1466724

SONY. 10 CHANNEL CORDLESS PHONE

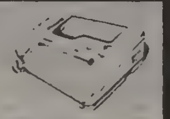


Introducing Sony's new Top Of The Line, SPP-170! It has all the features that you've been asking for. The battery will last for a week in standby, Intercom, and much more! Hurry, our supply won't last!

$197

Model SPP-170
#1516915

MURATA M900 COMPACT FAX MACHINE

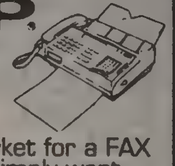


Quality doesn't have to cost a fortune. This hot unit has a five page feeder, automatic dialer and more!

$348

MODEL M-900
#1461198

SHARP COMPACT FAX MACHINE WITH AUTOMATIC PAGE FEEDER

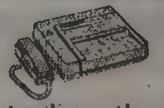


If you're in the market for a FAX Machine and you simply want THE BEST, you want SHARP! This hot unit has a 5 Page Feeder, Halftone and Much More!

$448

MODEL FO-120
#1544152

brother FAX-250

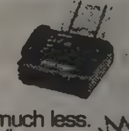


Fry's Electronics introduces the Brother Fax-250. This unit has a 10 page document feeder, 16 level grey scale, monitor, standard/fine resolution, 30 number memory, and paper cutter for only...

$568

#1571697

Canon FAX-80



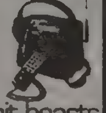
This Fax-80 from Canon is plain paper for less.... much less. This unit has automatic dialing, delayed transmission, polling ability, broadcasting, 6-page memory and verification stamp. This fax will even fax a page right out of a book! All this and Canon quality for the low price of...

PLAIN PAPER!

$1098

#1603909

ANTEL CELLULAR PHONE

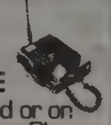


This amazingly affordable portable cellular phone has it all for less!! This unit boasts 10 number memory, full 3-watt power, last numbr re-dial, talk timer and signal strength indicator. All this in a slim leather-style case for just..

$219 95

Model STR-330
#1605107

Panasonic TRANSPORTABLE CELLULAR TELEPHONE



Whether you're on the road or on foot, the Panasonic® Cellular Phone keeps you in touch because it easily converts from a car phone into a transportable. It also offers a host of features designed for convenience and ease of use.

$418

FREE CAR KIT!

Model
TP-500
#1502550

MOTOROLA CELLULAR TELEPHONE

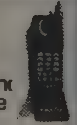
Get Motorola's hottest Cellular Telephone with Alpha-Numeric display, compact ergonomic design and low profile antenna for the amazing low price of . . .

World's Most Popular Phone!

$649

Model
9800 HX
#1591660

MOTOROLA FLIP PHONE HANDHELD CELLULAR TELEPHONE



When the call comes in, just extend the antenna, open the mouthpiece and talk. What could be simpler! Store 30 telephone numbers in memory and see what number you dialed on the large L.E.D. display. Talk for 75 minutes and when you complete your call, this phone slips neatly in your pocket! Value priced at...

FLIP PHONE!

$849

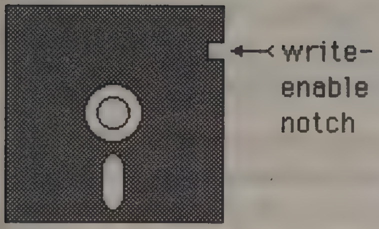
Model PC500
#1502516

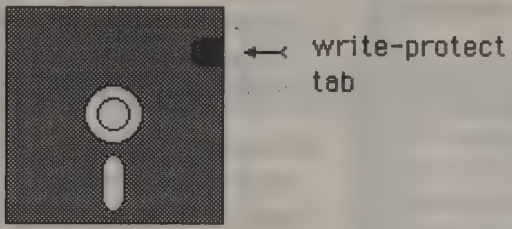
Continued from page 122

will be a continuing reminder of how old the disk is getting, and how urgently you need to back up the files on it.

ABOUT WRITE PROTECTION

If the information on a disk is particularly valuable, or if you simply want to ensure that it will not be accidentally erased, you can "write-protect" the disk. This mechanically prevents the disk drive from altering or erasing what is recorded on the disk. On 5.25" disks, there is a small square notch on the upper right-hand side. When this notch is covered by an adhesive tab, the disk is write-protected.

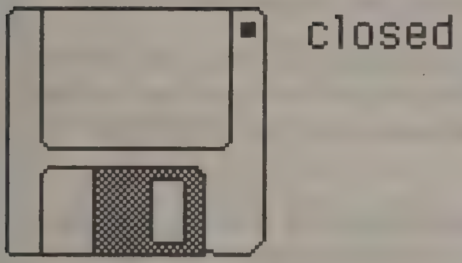


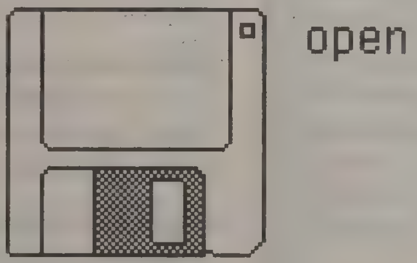


Remove the tab and the disk is "write-enabled." Boxes of new disks usually contain a sheet of these write protect tabs.

On 3.5" disks, write protection is based on a little window with a sliding plastic shutter (usually black) in the upper right corner. You slide the tab with a fingernail or the tip of a ball-point pen.

When the little window is open, and you can see daylight through it, the disk is write-protected. When the little window is closed, the disk is write-enabled. Since this is exactly opposite to the way the notch on 5.25" disks works, there are rich possibilities for confusion and grief. Welcome to the world of computing.





ABOUT COPYING DISKS

You will sometimes need to copy a disk. With copyrighted software, you are legally entitled to make one backup copy "for archival purposes." When you unpack a brand new program, you should be sure the original disks are write-protected before doing anything with them. Many experts recommend making backup copies immediately, and doing your hard disk installation from the backups. I have never seen anybody actually do this in the real world.

On the Macintosh, you copy things by dragging them from a source to a destination. With two floppy disk drives this is obvious and direct. The Mac operating system also allows you to do one-disk copying. This tricky procedure is less confusing if the original disk (the "source") and the copy disk (the "destination") have different names. Insert the original disk. When it appears on the desktop, eject it by pressing Command-E (or Command-Shift-1). This leaves behind a "ghost" image of the disk. Now insert the destination disk, drag the ghost of the orignal disk onto it and release the mouse button. The Mac will eject the copy, and prompt you to insert the original. Depending on the amount of data on the disk and the amount of memory in the Mac, you may be asked to swap disks several times. Many Mac users simply copy from an original floppy to the hard drive, and then from the hard drive to the destination disk. This makes sense because data is read from a hard disk much faster than from a floppy.

When you unpack a brand new program, you should be sure the original disks are write-protected before doing anything with them. Many experts recommend making backup copies immediately, and doing your hard disk installation from the backups. I have never seen anybody actually do this in the real world.

On a PC, the MS-DOS operating system offers two ways to make a copy: the COPY command to copy files and the DISKCOPY command to copy an entire disk. If the two disks are of different capacities, you have to use the COPY command. For example, to copy everything from a 5.25" disk in drive A onto a 3.5" disk in drive B, you would type:

```
C:/> copy a:*.* b:
```

To make a duplicate of the disk in drive A, you would type:

```
C:/> diskcopy a: a:
```

DOS will prompt you to swap disks as required.

FLOPPY DISK HANDLING PRECAUTIONS

The greatest enemy of the floppy disk is not exotic stray magnetic fields, electrical discharges, or gamma ray bursts, but plain old dirt. It is now fairly well accepted that airport X-ray machines and library book detectors do not generate energy levels that can damage data on a disk. Disks should be stored in a closed container and treated gently. Above all, disks should always be labeled with an indication of their contents.

Hey, what's this...
No label on it....
It's probably blank...
I'll just format it and copy my own stuff...

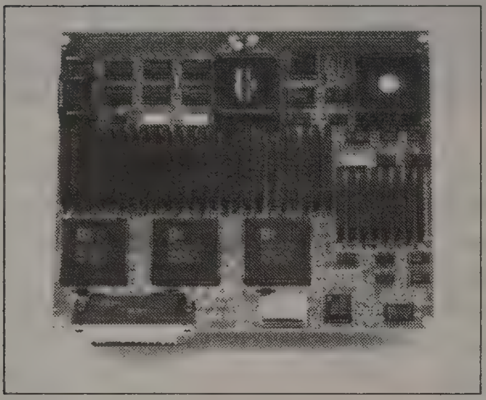
An unlabeled disk is a standing invitation to disaster. ■

PRODUCT SPOTLIGHT

New Products

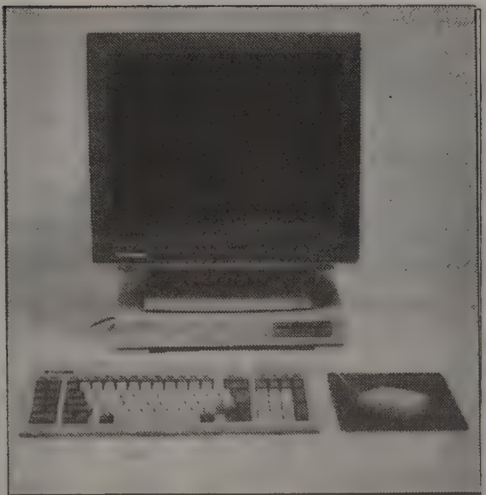
UNIX/SPARC HARDWARE

RASTEROPS VIDEO-IN-A-WINDOW



RasterOps has introduced the first high-resolution, 24-bit, live video-in-a-window capability for the Sun SPARCstation line of workstations. The PIP (Picture-in-Picture) Video Option is a card installed directly onto the SPARC Card TC (True Color), RasterOps' 24-bit color SBus display card. The two products together provide users with the ability to work with more than 16.8 million colors simultaneously to produce photographic quality images, as well as importing and capturing live video images. The SPARC Card PIP Video Option is a daughter board that occupies no additional slots and supports inputs of NTSC and PAL signals in composite, S-Video, and RGB/Sync formats. (Suggested retail price for the SPARC Card TC is $4995, the SPARC Card PIP Video Option is $1995) RasterOps Corp., 2500 Walsh Ave., Santa Clara, CA 95051. (408)562-4200.

TATUNG SPARC-COMPATIBLE WORKSTATION



The TWS-5020-CX is the new enhanced graphics SPARC-compatible workstation from Tatung that includes a 19" color monitor with a graphics accelerator card and 8MB RAM. It offers hardware coprocessor acceleration for a variety of user environments, including X11.R4, SunView, and PHIGS+. The graphics coprocessor card, from Megatek of San Diego, offers an active display area of 1152 x 900 or the higher resolution of 1280 x 1024. The pixel map ranges from 1640 x 1280 (standard) to 10240 x 8160 (with the optional pixel map memory that

Continued

PRODUCT UPDATES

➤**Bitstream** has introduced **FaceLift 1.5 for WordPerfect**. This new version will include three extra symbol typefaces: ITC Zapf Dingbat, Symbol Proportional, and Symbol Monospaced. Bitstream, Inc., 215 First St., Cambridge, MA 02142-1270. (617)497-6222.

➤**Procomm 2.1**, correcting several minor bugs, will be available free to registered users requesting it. **Datastorm Technologies, Inc.**, PO Box 1471, Columbia, MO 65205. (314)443-3282.

➤**EmmaSoft** introduced **Programmer's Super-Maint v2.00**, a major update of its shareware utility. Super-Maint is designed for the programmer who doesn't want to bother learning about make files—the special files a maker uses to know how to build an individual program. EmmaSoft, Inc., PO Box 238, Lansing, NY 14882-9009. (607)533-4685. CompuServe: 71460,2644.

➤**DOS Help! v5.0**, a hypertext DOS reference guide for MS-DOS 5.0 from **Flambeaux Software**, provides complete coverage for all versions of DOS. Registered owners may upgrade for $20. Flambeaux Software, Inc., 1147 E. Broadway, Suite 56, Glendale, CA 91205.

➤**Inset Systems** has announced the release of **HiJaak v2.02**, featuring 256-color support for Windows 3 and DOS screen captures. Registered users can receive the upgrade at no charge. Inset Systems, Inc., 1-800-828-8088.

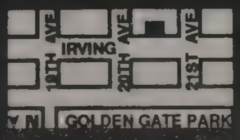
➤**Microcom** announced **Carbon Copy 6.0**, its remote control and file transfer software that now features support for Windows 3, DESQview 386, as well as for unlimited users on a single LAN. Microcom Systems, Inc., 500 River Ridge Dr., Norwood, MA 02062-5028. 1-800-822-8224.

➤**Power Up Software Corp.** has released **Address Book Plus 2.0**, its Macintosh application for managing names and addresses. Version 1.0 users can upgrade for $25 plus $4.95 for postage and handling. Power Up Software Corp., Attention: Address Book Plus Mac Upgrade, PO Box 7600, San Mateo, CA 94403. (415)345-5900.

➤**Quicksoft PC-Write Lite 1.03** fixes the bug that was found in spell checker for v1.02. Quicksoft, Inc., 219 First Ave. #224, Seattle, WA 98109. (206)282-0452.

➤**WeatherBank**, the nation's leader in on-line weather service technology, has released **WeatherBrief 4.0**. WeatherBank, Inc., Pier 26, The Embarcadero, San Francisco, CA 94105. (415)777-2760.

➤**CASEWORKS** and **Unisys** are entering into an agreement under which CASEWORKS will provide a specialized version of **CASE:PM** for Unisys's version of Presentation Manager running under CTOS operating system. CASEWORKS, Ind., 1-800-635-1577.



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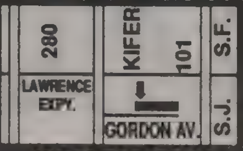
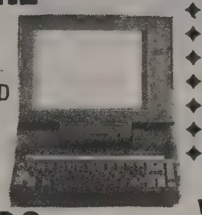


(408) 732-2244
2960 Gordon Ave.
Santa Clara, CA 95051
FAX (408) 732-4664

Chaplet

386-SX-20 MHz LAPTOP



- Fully VGA, EGA, CGA, MDA Compatible-640x480 CCFT LCD Display
- 1 MB Exp To 5 MB
- Built-In 1.44 & 40 MB HDD
- Rechargeable Battery
- 8 Bit & 16 Bit Slot
- Only 14.6 Lbs.

$2290

LA-30 286-12 MHz LAPTOP

- 80286-12 CPU
- 1 MB Exp To 5 MB
- 2 Standard Slots (1-8, 1-16)
- LCD 640x480 Back-Lit 11″ Screen
- 1.44 MB, 3½″ Floppy Drive
- 20 or 40 MB Hard Drive
- 2 Serial, 1 Parallel Ports

w/20 MB	w/40 MB
$1349	$1599

COMPLETE COLOR SYSTEM SPECIAL!

286-12 VGA SYSTEM

- 1 MB RAM
- 1.2 MB Floppy Drive
- 40 MB Hard Drive
- 101 Keyboard
- 200W/230W Power Supply
- IDE HD/FD Card
- 16-Bit VGA Card
- 14″ VGA (640x480) Monitor
- High Quality AT Case
- 2 Serial, 1 Parallel, 1 Game Ports

$835

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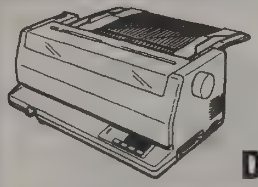

FUJITSU

DL1100

$288

24-wire matrix printer. Max resolution 360x360 dpi. 7 resident fonts. 24K buffer. Emulates Epson LQ-2500/2250 and IBM Proprinter. XL24 cps. Color: $338

BASIC HARD DRIVE SYSTEMS*

TECH 286-12 w/40 MB, 28ms HD	$519
TECH 286-16 w/40 MB, 28ms HD	539
TECH 386SX-16 w/40 MB, 28ms HD	699
TECH 386SX-20 w/40 MB, 28ms HD	749
TECH 386-25 w/80 MB, 18ms HD	999
TECH 386-25 w/64K CACHE, w/120 MB HD	1159
TECH 386-33 w/64K CACHE, w/120 MB HD	1199
TECH 486-25 w/128K CACHE, w/200 MB HD	1890
TECH 486-33 w/128K CACHE, w/200 MB HD	2290

*Systems include: 1 MB Memory, 1.2 or 1.44 MB floppy drive, IDE 1:1 HD/FD controller, clock & calendar, 2 serial/1 parallel/1 game ports, Costar mini 101 keyboard, desktop or mini-tower case w/power supply, socket for math co-processor and user's manual. All Systems have 1 Year Parts/Labor Warranty. Prices Listed Are Cash Only, CK or Credit Add 3%

SYSTEM UPGRADES SPECIAL!

MONO 12″ + MONOCHROME CARD	$92
MONO 14″ + MONCHROME CARD	129
SAMTRON VGA (640x480) + 16-BIT VGA CARD	319
RELISYS VGA (640x480) + 16-BIT VGA CARD	389
RELISYS SVGA (1024x768) + 512K 16-BIT VGA CARD	409
NANAO 9070S + SPEEDSTAR VGA w/1 MB	1175
FUJITSU DL1100 24-PIN PRINTER	288
ARC 250 CPS WIDE TEXT PRINTER	149

HARD DRIVES

Kyocera 20 MB	$149
ST-225 20 MB	179
ST-251-1 40 MB	239
ST-157A 40 MB	189
ST-1144A 120 MB	410
WD 20 MB	159
WD 40 MB	199
Maxtor 80 MB	375
CDC 91 MB SCSI	429
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Conner 200 MB	699

FLOPPY DRIVES

Teac 1.2 MB	$64
Sony 1.44 MB	65

MONITORS

Mono 12″	$89
Mono 14″	109
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ADI VGA .31	309
Power II .39 VGA	250
Samtron .41 VGA	265
Mono VGA 14″	139
Power II Super VGA	329
Actix Super VGA	325
NEC 3D	589
NEC 4D	999
Nanao 9070S	960
Nanao 9070U	999

CONTROLLERS

XT MFM HDC	$49
XT RLL HDC	49
DTC 5150 HDC	59
High-Density FDC	39
Adaptec 1542B Card	259
Adaptec 1542B Kit	279

I/O CARDS

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Serial Port	14
Printer Port	14
Game Port	15

KEYBOARDS

Northgate 101	$69
Northgate 102	78
Northgate Plus	99
Northgate Ultra	115
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Keytronic 101	42
Mitsumi 101	42
CoStar 7101P Mini	32
CoStar 7101N Mini	49

MICE

Logitech MouseMan	$85
Logitech C-9 Serial	68
Logitech C-9 Bus	74
Imsi Serial	45
Microsoft Serial	105
Microsoft Bus	109

PRINTERS

Star NX-1000 Color	$225
Star NX-1001	155
Star NX-2410	290
Fujitsu DL-2400	375
Fujitsu DL-3400	369
Fujitsu DL-4600	999
Brother M1809	339
Brother M1824	439
Brother M1714L	475
Okidata 390	469
Okidata 320	327
Panasonic 1180	145
Panasonic 1124	259
Canon BJ-10e	339
Alps 500	349

MODEMS

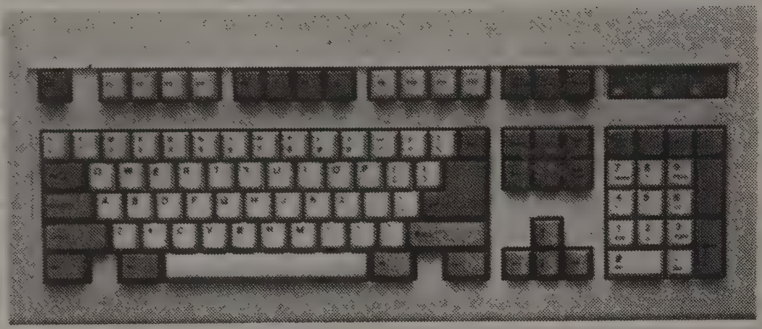
Accex 2400 Internal	$69
E-Tech 2400 MNP5	99
Everex 2400 Internal	99

MISC

CH Flight Stick	$45
CH Mach 1 + Joystick	24
Surge Protector	9^{95}

CALL FOR OTHER ITEMS NOT LISTED

COSTAR
KEYBOARDS
SAME 101 KEYS,
SAME HIGH QUALITY!
TAKES 25% LESS DESK SPACE!!!
Compare
the difference!



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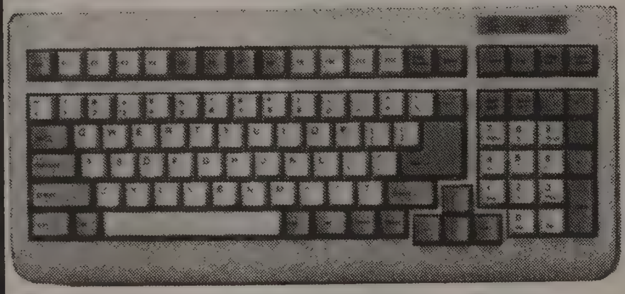
STANDARD 101-KEY KEYBOARD



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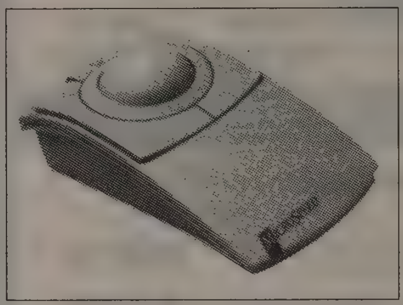
is on the coprocessor card). Having the pixel map larger than the display area is an advantage for GIS and CAE/CAD applications. (Suggested list price is $9995, or without graphics accelerator card is $6995) Tatung Science & Technology, Inc., 2060 Ringwood Ave., San Jose, CA 95131. (408)435-0140.

NEW PROFILE TRACKBALL FOR WORKSTATIONS



S-TRAC trackball offers an alternative to the mouse for the Sun-3, Sun-4, SPARCstation, Sun 386i, and Silicon Graphics workstations. This stationary pointing device requires only three inches of width on the desktop and incorporates three buttons surrounding a 2.25" ball and sloped hand rest. The S-TRAC offers complete systems compatibility, requires no software, and includes a dynamic gain algorithm that automatically adjusts the device resolution to match the resolution requirements of the application, from 100 to 1600dpi. It is designed to minimize wrist fatigue and accommodate different size hands. The three buttons are functionally identical to those on the Sun and Silicon Graphics mice and can be activated by thumb or fingertips, and by right- and left-handed users. ($199) MicroSpeed, Inc., 44000 Old Springs Blvd., Fremont, CA 94538. (415)490-1403.

TEKTRONIX PHASER II COLOR PRINTERS

Tektronix has added NeWSprint support to its Phaser II family of 300dpi thermal color printers. NeWSprint, a software raster image processor (RIP) from Sun Microsystems, rasterizes PostScript files on a SPARCstation before sending them to the printer. Tektronix offers two NeWSprint solutions. The Phaser II SXS provides economical PostScript-only printing. For high-performance shared network printing, the Phaser II DXN with NeWSprint handler adds PostScript language-compatible printing to existing color screen printing capabilities. (Suggested retail price for the Phaser II SXS is $5195, the Phaser II DXN is $12,990.) Tektronix, Inc., M-S 63-583, PO Box 1000, Watsonville, OR 97070. 1-800-835-6100. Internet: color_printers@tektronix.com.

MITSUBISHI OFFERS COST-EFFECTIVE COLOR OUTPUT

With the introduction of its Print Handlers for Sun Microsystems' NeWSprint software, Mitsubishi can easily integrate its high-performance color printers within the Sun SPARC environment, allowing users to quickly produce PostScript-compatible color output. All three of Mitsubishi's high-performance color printers are compatible with the Sun SPARCstation. The S340 Sublimation Thermal Printer produces near-photographic qual-

Continued

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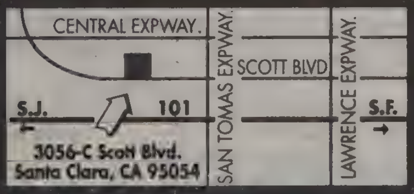

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- 100MB Hard Drive
- 4MB RAM
- 2 Floppy Drives
- 1024x768 VGA Color Monitor

Mylex's newest 386 is so fast that even we are impressed. And it's new design actually reduces the number of components and power consumption while increasing reliability. Complete system includes 100 MB hard drive, 1024x768 VGA color monitor, parallel and 2 serial ports, 4 MB RAM and MS-DOS.

Complete System Includes MS-DOS & Mouse!

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Relysis RE1420 1024x768 S Multisync	365
Relysis 15″ SVGA Non-Inte SVGA	465
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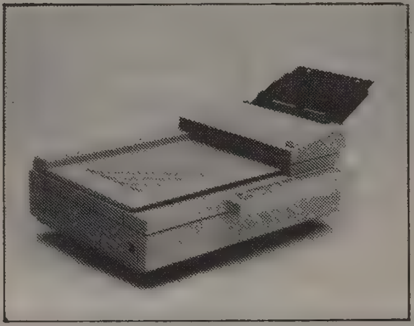
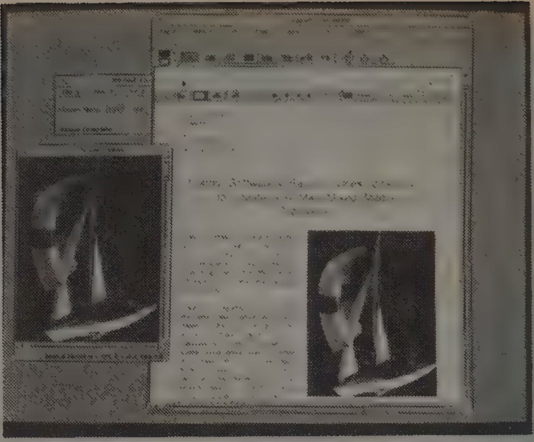
ity color hard copy utilizing the leading edge dye diffusion technology. Both the G370-10 and G650-10 are 300dpi printers that use an advanced thermal wax transfer technology for color-critical application and high-resolution hard copy requirements. Mitsubishi Electronics America, Inc., Information Systems Division, 991 Knox St., Torrance, CA 90502. (213)515-3993.

XEROX SCANWORX



ScanWorX is a new scanning system from Xerox Imaging Systems (XIS) that allows users to achieve high-speed text recognition and image capture on the Sun platform. ScanWorX, running under UNIX with SunView GUI on the Sun 3X, 4, SLC, and SPARC workstations, includes a high-resolution 400dpi scanner, an automatic document feeder, and XIS's Intelligent Character Recognition software. Scanning at a rate of up to three to four seconds per page, ScanWorX is ideal for the management of projects that includes significant re-keying of text. Other features include Intensive Character Verification, Style-based Conversions that allow documents containing text and graphics to be scanned and output in standard publishing industry formats such as Interleaf and FrameMaker, and recognition of ten languages including German, Danish, Spanish, and Norwegian. ($17,950, and $2500 for each additional workstation needing software access) Xerox Imaging Systems, Inc., 185 Albany St., Cambridge, MA 02139. (617)864-4700.



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VideoPix allows users to easily capture and share still frame video images across a UNIX network. It includes a postcard-sized add-in board and software that lets up to four users easily capture, manipulate, store, and share color and black-and-white images from a variety of video sources. VideoPix can be used to create a database of images for company directories, parts catalogues, insurance records, or real estate listings. Users can capture 8- or 24-bit color or grayscale images, integrating them into applications such as desktop publishing or multimedia mail. It accepts input based on worldwide standards, NTSC/PAL Composite or S-Video and utilizes JPEG compression. (The board, software, libraries, documentation, and one right-to-use license are priced at $895) Sun Microsystems, Inc., 2550 Garcia Ave., Mountain View, CA 94043. 1-800-821-4642.

UNIX/SPARC SOFTWARE

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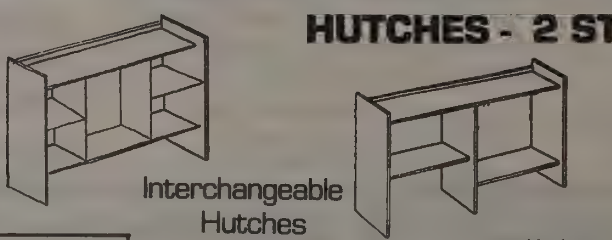

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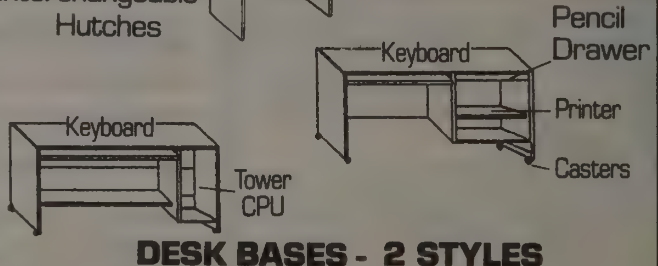

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386/SX NOTEBOOK

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- 20MB hard drive
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PC MAGAZINE "In terms of general performance the ACMA is a prince among peers." "...faster than the rest of the machines in the pack." "...the ACMA 486/25 represents a good value in a top-end machine."

COMPUTER SHOPPER Acma's 486/25 system qualifies as another heavy weight tower system." "Acma's 80486 offering wins Round Three on points."

PC Sources "Acma's Gentle Giant...It's a serious tool with a competitive price and components that give it enviable performance."

BYTE Byte Magazine recently reviewed and Acma 486 EISA an applauded it with high praise. They touted it as one of the very best! For a free copy of this, and all of the other tremedous reviews of Acma's computers, call Acma today!

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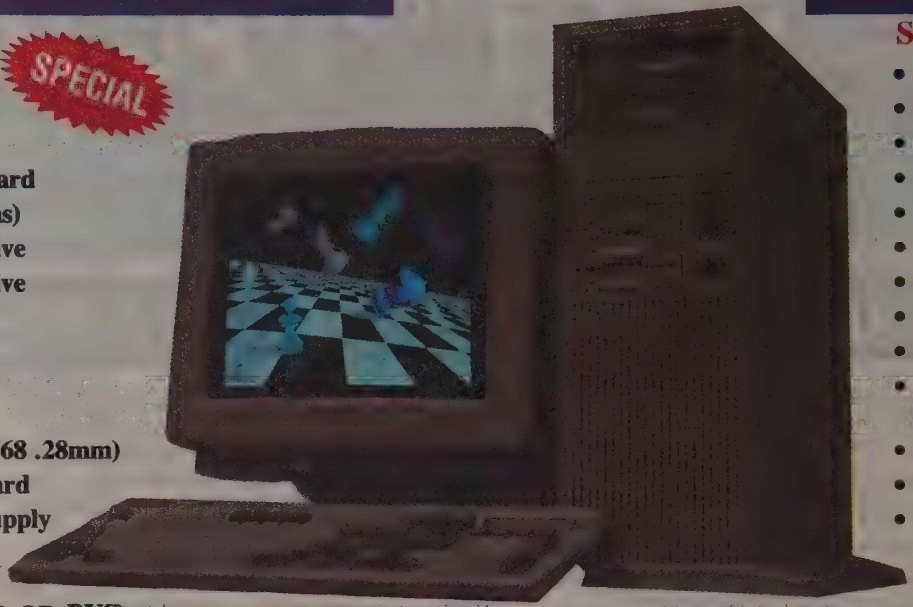

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- 2 serial, 1 parallel, 1 game port
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- 3.5″ (1.44 MB) TEAC floppy drive
- IDE FDD/HDD controller
- 2 serial, 1 parallel, 1 game port
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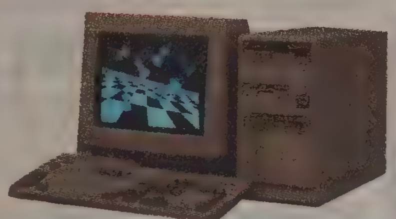

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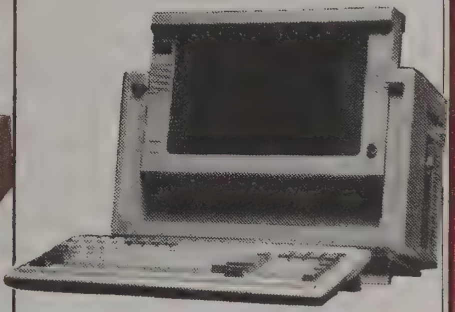

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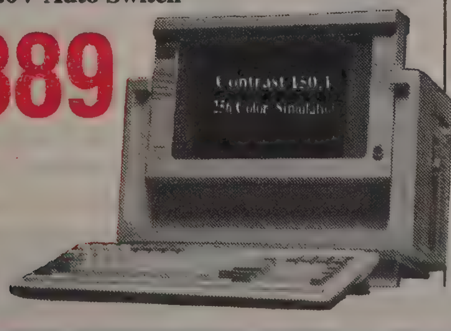

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- Ext Monitor Connector
- Contrast Ratio 12:1
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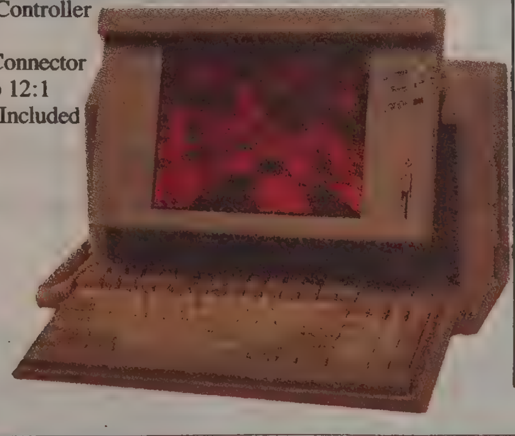

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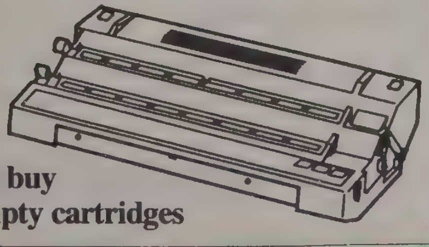

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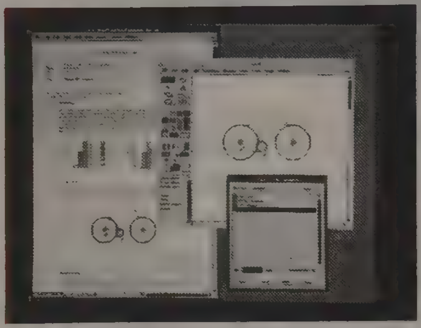


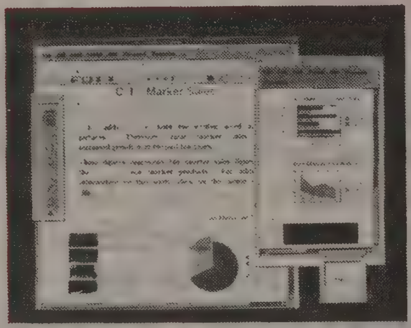
includes advanced word processing, integrated graphics, a powerful set of macro tools, and an optional spreadsheet. Asterix features compound documents, live links among Asterix applications, and floating network licensing. In addition, users can easily customize the interface, integrate, or link live with third-party applications. Version 1.1 also includes audio, video, and fax capabilities. ($995 for the complete set or $695 for Asterix without spreadsheets) Applix, Inc., 112 Turnpike Rd., Westboro, MA 01581. (508)870-0300.

ARTLINK FOR THE SUN SPARCSTATION

Hyphen, Inc. has announced Artlink for the Sun SPARCstation. This software package enables users to store all graphic files on a SPARC fileserver while allowing application workstations to link changes to those graphics. Artlink has many benefits for the user; most importantly time savings. Because the graphics are stored on the SPARC, the transfer time from the workstation to the SPARC is significantly reduced. Artlink can be configured to print to more than one printer simultaneously. In addition, all graphic files are available to all other workstations on the network. Hyphen, Inc., 187 Ballardvale St., Wilmington, MA 01887. (508)988-0880.

CLARITY RAPPORT

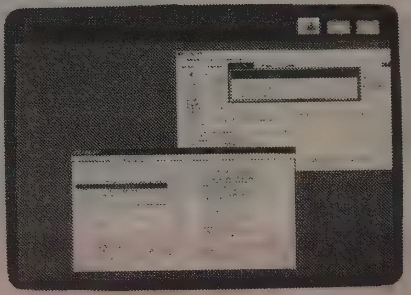
Rapport provides UNIX workstation users with a complete and open suite of software tools for everyday use, including a compound document editor, spreadsheet, presentation graphics, and advanced email with support for audio and fax. Currently, Rapport runs under Motif and Open Look graphical user interfaces on DEC, HP/Apollo, IBM, SGI, Sun, and all SPARC-compatible UNIX worktations. It requires a workstation with 12–16MB RAM and 300MB disk space. While components of the Rapport suite work together in a tightly coupled manner, other UNIX productivity tools, such as FrameMaker, WingZ, and 1-2-3, may also function as suite members. ($895 per seat. Rapport is available to try free for 30 days) Clarity Software, Inc., 2700 Garcia Ave., Mountain View, CA 94043. 1-800-235-OPEN or email to sales@clarity.com.



MAC ON A SPARC

Companion+ from RDI Computer Corp. is a Macintosh emulator for the SPARC platform. It bridges the gap between SunOS and MacOS by emulating the Motorola 68000 processor, enabling Macintosh software to run on any SPARC workstation. Users can access both Sun and Mac systems simultaneously by using Open Windows, a Sun windowing user interface. Companion+ is a hardware/software combination that utilizes a Macintosh Classic ROM on an SBus board. ($1995) RDI Computer Corp., 6815 Flanders Dr., San Diego, CA 92121. (619)558-6985.

DBASE IV FOR 386 UNIX



dBASE IV v1.1 is now available for 386- and 486-based PCs running on SCO's UNIX and XENIX 386, as well as AT&T, Interactive, and ESIX UNIX. This new version joins dBASE IV for DOS, Macintosh, SunOS, and VAX/VMS as part of Ashton-Tate's cross-platform strategy. Users will enjoy the same look and feel as the DOS version, making migration to UNIX systems easy. Also, thousands of existing dBASE applications can be used on UNIX systems with little or no modification. ($995) Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90509-9972. (213)329-8000.

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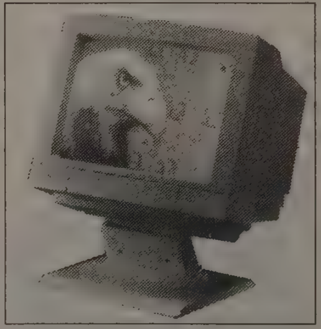

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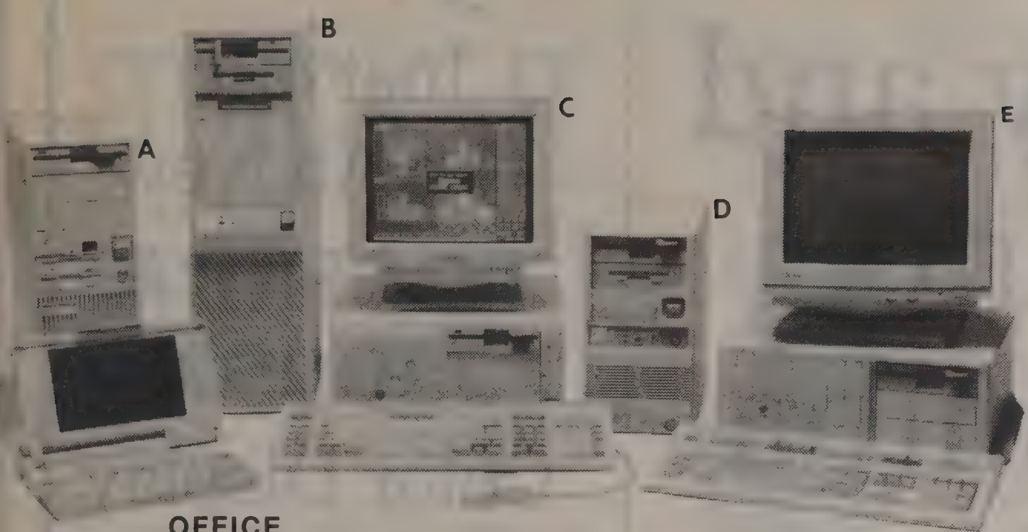

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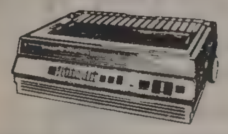

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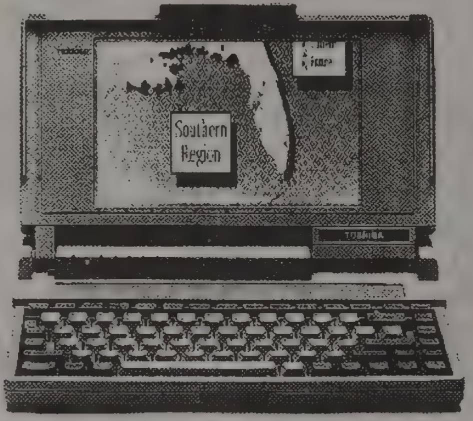

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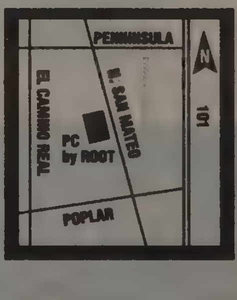

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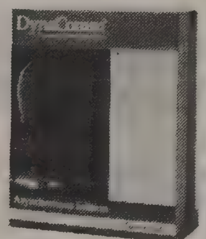

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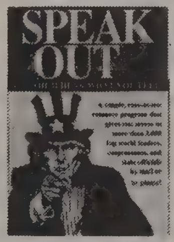

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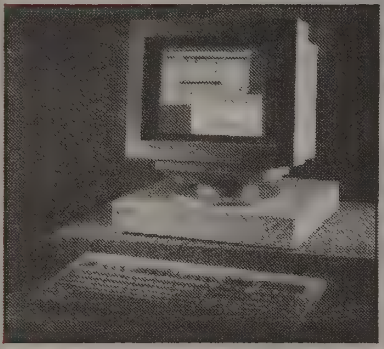
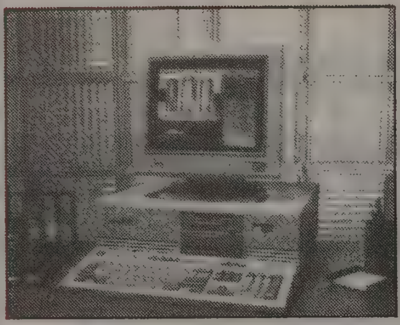
(The LR 386-16MHz SX sells for $1599) Micro Telesis, Inc., 1260 Logan, Unit A-2, Costa Mesa, CA 92626. (714)557-2003.

PARS LOW-COST WORKSTATION



Pars International has created a new all-in-one board workstation with I/O, floppy disk controller, and Super VGA built on the board. This workstation also includes 1MB RAM, expandable to 16MB. In addition to working on Motif Windows systems, you can run in the Sun, DEC, and HP workstation environments as an X-Terminal, as well as functioning as a small office server and a diskless workstation. It comes complete with a 20MHz 386SX system with 64K Cache, plus a 40MB hard disk drive and a 1024 x 768 VGA card. (Prices start at $1499 for the basic unit with Super VGA and monitor). Pars International, (415)733-0103.

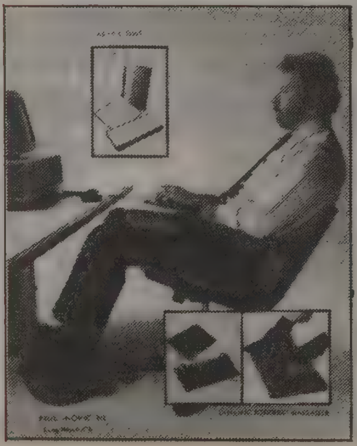
COMPAQ POWER



The Compaq Deskpro 486/50L is a high-performance 50MHz 486-based desktop PC designed for engineers, scientists, and other professionals in highly technical fields. The new PC also functions well as a network server or multiuser host running applications that require advanced processing power. All models of the 486/50L come standard with a 256K second-level write-back memory cache for added performance, 8MB RAM expandable to 104MB, superfast disk drives, Advances VGA graphics, and seven available EISA slots (all bus masters). It can support storage of 2MB internally, and more than 20GB when combined with external storage solutions. (The base model 120 with 120MB hard disk drive has a suggested list price of $1129) Compaq Computer Corp., PO Box 692000, Houston, TX 77269-2000. (713)370-0670.

ACCESSORIES

ERGO-NOMIC COMPUTING COMFORT

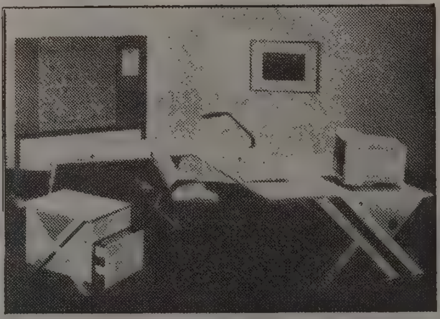


ERGO-NOMIC has developed two products to reduce health-related computer problems such as Carpal Tunnel Syndrome, backache, shoulder strain, and leg fatigue. These new products are designed with the understanding that people are different sizes and sit at computers differently than when they are just sitting in a chair. The CTS-Pillow sits on your lap with the keyboard to allow you to sit comfortably back in the chair to reduce backache, shoulder strain, and repetitive stress injuries. The Dynamic Footrest Massager has a built-in foot rocker to promote easy movement and still assume the correct angle for every leg length and chair height. The reverse side of the footrest is a massager to help leg stress while you are working at your desk. ERGO-NOMIC, Inc., 4102 E. 7th St., Suite 260, Long Beach, CA 90804. 1-800-829-8951.

TOP O' THE MONITOR

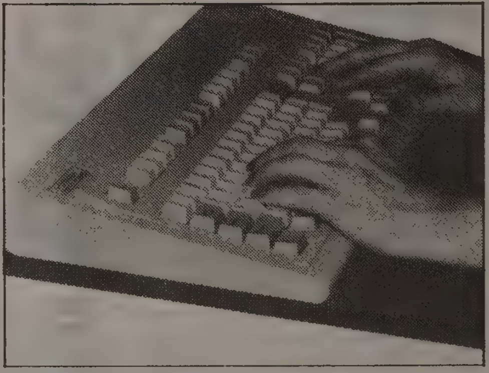
Monitor Topper helps you keep your desk space clear of clutter. Using a patented mounting system, it fits on top of any monitor to hold papers, pens, stapler, and mouse when not in use on your computer. Monitor Topper is also a copy holder that fits on either side. There is an optional static electricity ground available at no extra cost. Monitor Topper uses no glue, clamps, or Velcro, and no tools are needed for installation. ($19.95) Aravaipa Assoc., Inc., PO Box 256, Oracle, AZ 85623.

LIGNE X CADD FURNITURE



Creativity through comfort is the philosophy behind a new line of office furniture designed to meet the needs of people doing CADD (computer-aided design and drafting) work. The principles of ergonomics were taken into account in the Ligne X line. The furniture features two platforms that form the station top. The rear platform can be adjusted four inches above or below, or level to the front platform. In addition, the large surface area provided by the platforms permits any size document or plan to be readily handled. Electrical wiring and connections are all housed in a large triangular box hidden below the surface. French Technology Press Office, Inc., 401 N. Michigan Ave., Suite 601, Chicago, IL 60611. (312)222-1235.

WRISTONICS PAD



The Wristonics comfort pad for computer keyboards provides a comfortable shock absorbing base to rest the wrists on while working at your computer. Made from the same materials used in combat aircraft to protect pilots's heads against impact, these keyboard comfort pads help prevent repetitive wrist injury, while reducing fatigue and stress. ($14.95) Marcus Franklin & Associates, Inc., 6507 E. Curculo Dali, Anaheim Hills, CA 92807-4906. (714)921-1810. -

ERGONOMIC WRIST SUPPORT

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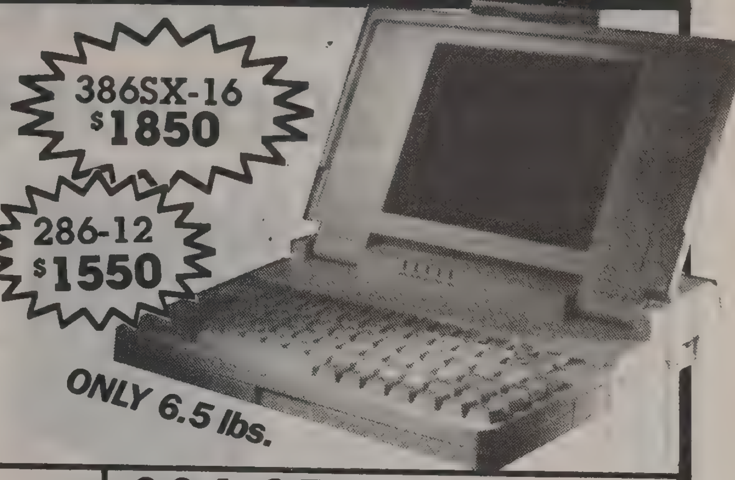

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- 1 MB RAM expandable
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- Clock/Calendar
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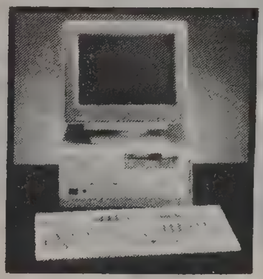

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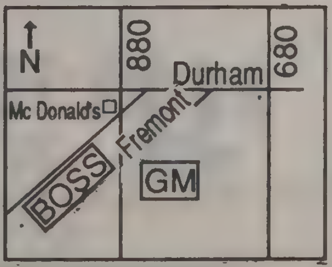

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  Norton SI (v4.5): 39.0
- ◇ **Warranty**—1 Year Parts & Labor

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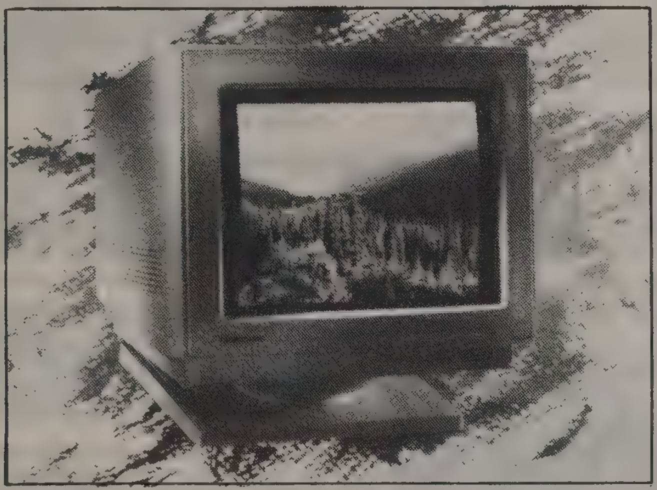

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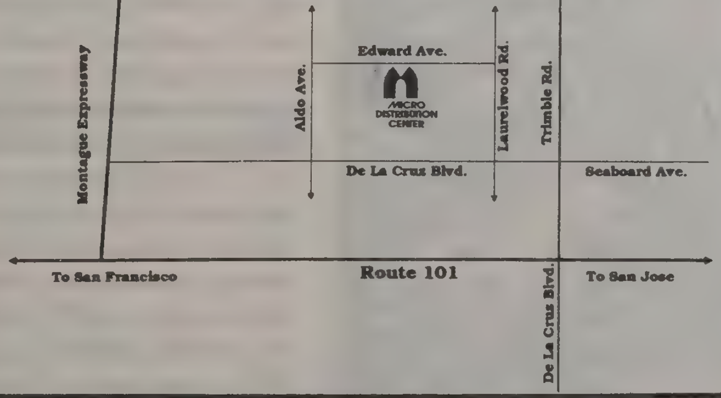

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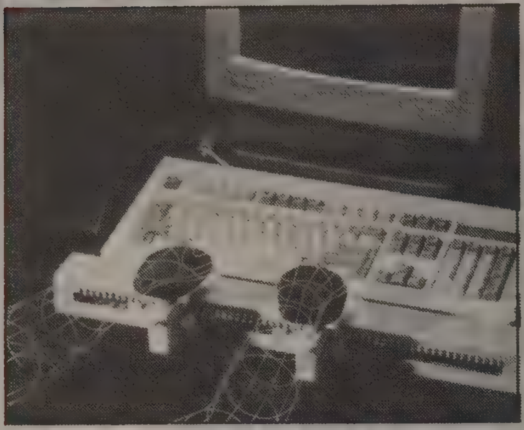
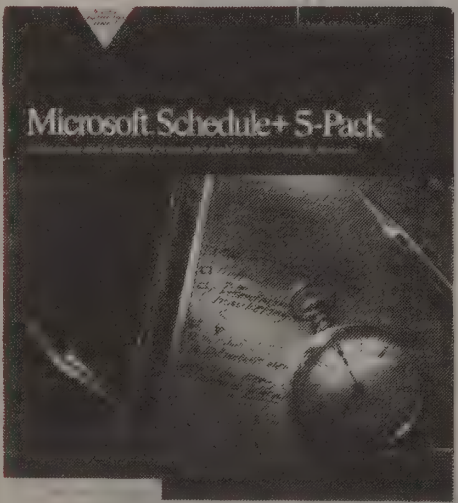


hance user comfort and productivity: the Wrist Reminder, a portable wrist rest worn to lightly support the palm while limiting downward wrist flexibility; the Keyboard Platform, which mounts under the keyboard on the desktop to adjust the angle of the keyboard and provide height-adjustable, wrist support; Adjustable Wrist Rest, a height-adjustable, free-standing wrist rest for keyboards; and the Wrist Trolley, which supports wrists independently during data entry at the keyboard. (Prices range from $19.95 for the Reminder to $99.95 for the Trolley) MicroComputer Accessories, Inc., 5405 Jandy Pl., PO Box 66911, Los Angeles, CA 90066-0911. (213)301-9400.

PC SOFTWARE

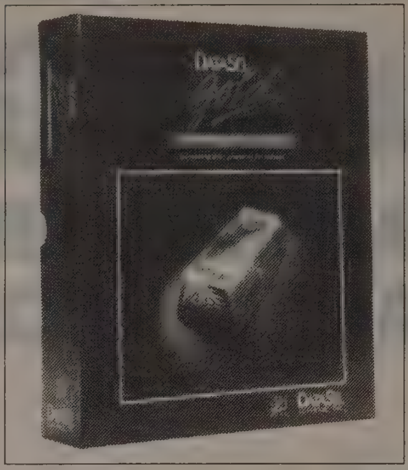
DESKTOP VIRTUAL REALITY

Sense8 has introduced the first complete PC-based system for virtual world applications. The WorldTool Development System combines Sense8's WorldToolKit, an Intel 486 25MHz desktop computer, and an Action Media 750 Delivery Board so that developers can build virtual world applications that include real-time mapping. WorldToolKit is also available separately for application developers. WorldToolKit is targeted to C language programmers with moderate programming ability. Several example ready-to-run programs are included with the toolkit. (WorldToolKit Software $3500; WorldTool Development System, $15,400) Sense8 Corp., 1001 Bridgeway, PO Box 477, Sausalito, CA 94965. (415)331-6318.



MICROSOFT SCHEDULE+

Microsoft Schedule+ is Microsoft's first calendaring and scheduling product offering a full-featured time management program. It includes a convenient personal calendar, allows you to view the calendars of others, and facilitates setting up meetings by helping you find available times, as well as send meeting requests and confirmations. Schedule+ works with Microsoft Mail for AppleTalk Networks v3.0. For easy network administration, Microsoft Mail and Schedule+ share the same database and directory service. (Retail price is $195 for five users) Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (206)882-8080.



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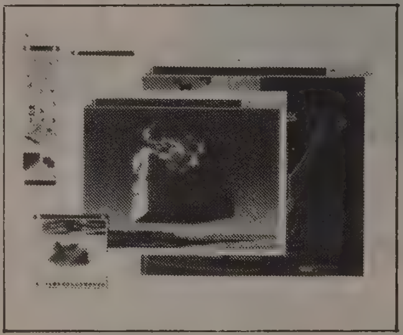
MACINTOSH SOFTWARE

PIXELPAINT PROFESSIONAL 2.0



PixelPaint Professional 2.0 makes significant breakthroughs in three major areas: traditional tools, artistic image processing, and a simple yet powerful user interface. SuperMac Software recognizes that the Macintosh is capable of some effects that cannot be achieved in physical media. Therefore, they have added many unique special effects and artistic image processing tools to stimulate the creativity of users. The ability to easily interact with the program is an important feature. For example, the interface consists of three floating palettes: the tool palette, the color mixer, and the coordinates window. PixelPaint Professional 2.0 is System 7.0 compatible. ($799) SuperMac Corp., 485 Potrero Ave., Sunnyvale, CA 94086. (408)245-2202.

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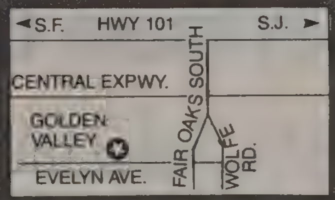

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- 1 MB Expandable to 8 MB
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- 1:1 Interleave HD/FD Controller
- Socket for 80387
- 2 Serial, 1 Parallel, 1 Game Port
- Tower or desktop case w/230W power supply
- Maxi-Switch 101 Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

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386-33 MHz 64K Cache

- 1 MB Expandable to 8 MB 32 MB on Board
- Chip and Teah chip set
- 64K Static Cache Memory
- Landmark=57
- Shadow Ram
- Teac 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Socket for 80387
- 2 Serial, 1 Parallel, 1 Game Port
- Tower or desktop case w/230W power supply
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OPTIONAL:

w/system purchase

12" Mono Monitor & Card	$90
VGA Monitor (640x480 .52 Dot Pitch) w/16 Bit 800x600 Card	$265
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Super VGA Monitor (1024x768 0.28) w/SVGA Card 512K	$365
Non-Interlaced SVGA Monitor w/SVGA Card 512K	$450

286-16 MHz 0 Wait

- Landmark =21
- 512K Expandable to 4 MB
- Real Time Clock
- 8 Expansion Slots
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- 1:1 HD/FD Controller
- 1.2 or 1.44 MB Floppy Drive
- 230 W Power Supply
- 101 Enhanced Keyboard

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286-12 MHz 0 Wait

- 6/12 MHz 0 Wait
- 512K Expandable to 4 MB
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- Shadow RAM
- Landmark=16
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- Teac 1.2 or 1.44 MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Socket for 80387
- 2 Serial, 1 Parallel, 1 Game Port
- Tower or desktop case w/230W power supply
- Maxi-Switch 101 Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

$575
386-25 MHz
- Landmark=36.7
- 1 MB Expandable to 8 MB
- Shadow RAM, Page Interleaved Memory
- Socket for 387, Weitek 1167
- 1:1 Interleave HD/FD Controller
- 2 Serial, 1 Parallel, 1 Game Port
- Teac 1.2 or 1.44 MB Floppy Drive
- Tower or desktop case w/230W power supply
- Maxi-Switch 101 Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

$515
386-SX 20 MHz
- Landmark=26.5
- 1 MB Expandable to 8 MB
- Chip & Tech. NEAT Chip Set
- EMS LIM 4.0 Built-In On Board
- Shadow RAM
- Page Interleaved Memory
- 1:1 HD/FD Controller
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- Supports MS-DOS, OS/2, Unix, Xenix

$475
386-SX 16 MHz
- Landmark=23.5
- 1 MB Expandable to 8 MB
- Chip & Tech. NEAT Chip Set
- EMS LIM 4.0 Built-In On Board
- Shadow RAM, Page Interleaved
- 2 Serial, 1 Parallel, 1 Game Port
- 1:1 Interleave HD/FD Controller
- Teac 1.2 or 1.44 MB Floppy Drive
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Keytronic 101 Key	45
Maxiswitch 101 Key	45

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OAK SVGA (1024x768 512K)	85
Trident VGA w/1 MB RAM	115
Orchid Pro Designer II S w/1 MB	185
AT M I/O (2S, 1P, 1G)	29
WA3 FD/HD Controller	65
1:1 FDC/HDC (MFM)	65
DTC 7280 1:1 FDC/HDC	65
DTC 7287 1:1 FDC/HDC (RLL)	75
DTC 6280 ESDI	135
IDE Card w/cable	25

Motherboard

8088 10 MHz	$65
286 6/12 MHz 0 Wait	110
286 8/16 MHz 0 Wait	150
386-25 MHz 0 Wait	370
386-25 MHz 64K Cache	450
386-33 MHz 64K Cache	475
486-25 MHz Motherboard	850
486-33 MHz Motherboard	1120

Hard Disk

ST-251-1 (40 MB, 28 MS)	$239
Western Digital 40 MB IDE (28 MS)	175
Seagate 157 A 44 MB IDE (29ms)	175
NEC 3142 (44/66 MB, 24 MS)	275
Western Digital 85 MB (18ms)	290
Seagate 1102 89 MB IDE (18ms)	290
Conner 100 MB	340
Seagate 1144 125 MB	370
Conner 30104 120 MB (18ms)	370
Conner 200 MB (16ms)	595
Maxtor 4170E ESDI 150 MB, 14 MS	790
Maxtor 4380E ESDI 320 MB, 16 MS	1090
Maxtor 8760E ESDI 660 MB, 16 MS	1750

Misc.

287-8/10	$90/90
387-16/20	CALL
387-25/33	CALL
165W (XT) Power Supply	35
230W Power Supply	48
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Logi Hi-Res Mouse/Mouse Man	60/69
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DFI Mouse (3 Button, Micro Soft Compatible)	45
AT Jr. Case (XT)	32
AT Deluxe Case	48
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Fax Modem (4800 FAX, 2400 modem)	95
Fax Modem (9600 FAX, 2400 modem)	145

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Hyundai Mono	$70
14″ Flat Screen	95
Hyundai EGA	275
Hyundai VGA .52	230
Hyundai VGA 640x480 .39	260
Hyundai VGA 3.1	285
Super VGA (1024x768) 0.28	305
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Seiko 1450	595
Sony 1304	615

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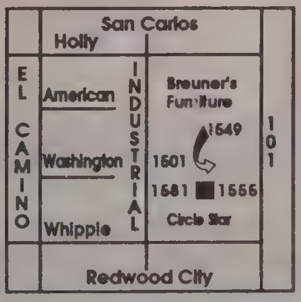

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- Basic Configuration
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- 45 MB, 28ms Hard Drive
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A. Which one category best describes your company?

- ☐ 01 Manufacturing of computer equipment, computers, DP hardware, peripherals
- ☐ 02 Software development
- ☐ 03 Manufacturing
- ☐ 04 Agriculture, Mining, Construction
- ☐ 05 Transportation
- ☐ 06 Communications
- ☐ 07 Utilities
- ☐ 08 Finance, Banking, Insurance
- ☐ 09 Real estate
- ☐ 10 Health, Medical service
- ☐ 11 Legal
- ☐ 12 Education
- ☐ 13 Data processing, Computer service
- ☐ 14 Government
- ☐ 15 Consultant
- ☐ 16 Wholesale/Distributor
- ☐ 17 Research/Development
- ☐ 18 Engineering/Architecture
- ☐ 19 Advertising
- ☐ 20 Sales/Marketing
- ☐ 21 Personnel Placement
- ☐ 22 Entertainment
- ☐ 23 Other

B. Which one category best describes your job title?

- ☐ 01 Owner, Partner, President
- ☐ 02 VP, Gen. Mgr.
- ☐ 03 Marketing Manager
- ☐ 04 Business Manager
- ☐ 05 Sales Manager
- ☐ 06 Project Manager
- ☐ 07 Data Processing Manager
- ☐ 08 MIS Director
- ☐ 09 Systems Analyst
- ☐ 10 Engineer
- ☐ 11 Educator
- ☐ 12 Bus. Microcomputer Specialist

C. How many employees does your company employ?

- ☐ 01 Over 5000
- ☐ 02 2500-4999
- ☐ 03 1000-2499
- ☐ 04 250-999
- ☐ 05 100-249
- ☐ 06 25-99
- ☐ 07 10-24
- ☐ 08 Under 10

D.What department are you in?

- ☐ 01 Accounting
- ☐ 02 Administration Management
- ☐ 03 Communications
- ☐ 04 Data Processing
- ☐ 05 EDP/MIS
- ☐ 06 Education/Training
- ☐ 07 Engineering
- ☐ 08 Finance
- ☐ 09 Marketing
- ☐ 10 Operations
- ☐ 11 Personnel
- ☐ 12 Production/Plant
- ☐ 13 Purchasing
- ☐ 14 Research & Development
- ☐ 15 Sales
- ☐ 16 Other

E. What is your department's estimated budget for computer and computer related peripherals for the next 12 months?

- ☐ 01 Over $500,000
- ☐ 02 250,000 to 499,999
- ☐ 03 100,000 to 249,999
- ☐ 04 50,000 to 99,999
- ☐ 05 25,000 to 49,999
- ☐ 06 10,000 to 24,999
- ☐ 07 Under 10,000

F. Through what channels will your department purchase its computers and peripherals?

- ☐ 01 Computer Retail Store
- ☐ 02 Distributor /Wholesaler
- ☐ 03 Value Added Reseller
- ☐ 04 Consultant
- ☐ 05 Mail Order
- ☐ 06 Manufacturer
- ☐ 07 Other

G. How are you involved in your company's purchasing decisions?

- ☐ 01 I approve purchase
- ☐ 02 I specify product and vendor
- ☐ 03 My opinions influence purchase
- ☐ 04 I do not influence purchasing

H. For how many personal computers do you have this involvement?

- ☐ 01 1 to 5
- ☐ 02 6 to 10
- ☐ 03 11 to 25
- ☐ 04 26 to 50
- ☐ 05 51 to 100
- ☐ 06 100 or more

I. Does your company have personal computers?

☐ 01 Yes ☐ 02 No

IA. Currently Own
IB. Plan to purchase within next 12 months.

IA	IB	
		BRAND NAME COMPUTER
		AT
		286
		386 SX
		386
		486
		COMPATIBLE
		AT
		286
		386 SX
		386
		486
		MACINTOSH
		Mac SE or below
		Mac II up
		Amiga
		Atari
		Mainframe
		Mini System
		Network

PERSONAL DATA
(PLEASE PRINT)

Your Company Name ____________________

Your Name ____________________

Title ____________________

Address ____________________

City/State/Zip ____________________

Your Signature ____________________ Phone # ____________________

Date ____________________

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PC MAGAZINE

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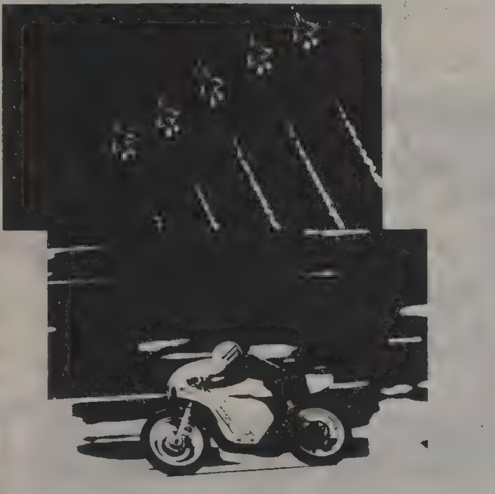

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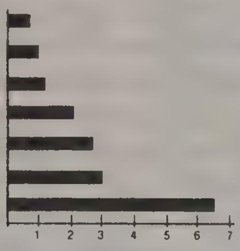
SpeedSTAR VGA™... the pacesetting facts

PC Labs Direct to Screen Test
test results in seconds



VGA Product Name	Direct to Screen	BIOS w/o Scroll	BIOS w/ Scroll
Diamond ***SpeedSTAR VGA***™	**0.71**	0.77	1.43
* Compaq 386/33 built-in VGA	**0.99**	0.33	0.99
Video Seven VGA 1024i	**1.21**	0.93	1.60
Paradise VGA 1024	**2.09**	2.04	3.96
Everex Viewpoint VGA	**2.69**	1.54	2.64
Orchid ProDesigner	**3.02**	6.26	7.80
* IBM PS/2 70 built in VGA	**6.53**	0.66	3.40

PC Labs VGA Benchmark Tests: test results in seconds using Everex 386/16 except as noted by *

Extended Graphics Modes	Pixels	Colors	Display	DRAM Required	Monitor Timing
* interlaced	1024x768*	16/256	VI,AD	512K/1M	31.5KHz/39.0Hz
** SpeedSTAR+ VGA Only	1024x768*	16/256	VF	512K/1M	35.4KHz/44.0Hz
	1024x768	16/256	VF	512K/1M	48.9KHz/60.0Hz
	1024x768**	16/256	VF	512K/1M	56.5KHz/70.0Hz
	800x600*	16/256	VI,AD	256K/512K	31.5KHz/48.0Hz
	800x600	16/256	VF	256K/512K	35.4KHz/56.0Hz
	800x600	16/256	VI	256K/512K	37.9KHz/60.0Hz
	800x600	16/256	VF	512K/1M	48.1KHz/72.0Hz
	640x480	16/256	VI,AD	512K/1M	31.5KHz/60.0Hz
	640x480	16/256	VI	512K/1M	35.4KHz/69.0Hz
	640x480	16/256	VF	512K/1M	37.6KHz/72.0Hz

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GAMES REVIEW

By Mike Markowitz

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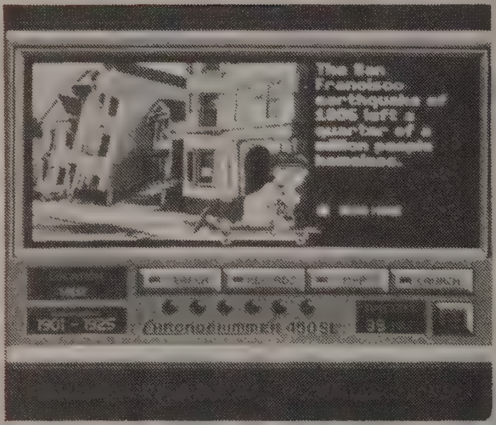
List Price: $59.95

Carmen is back, and she's bigger, badder, and more beautiful than ever. This is the fifth title in a series that has sold over two million copies for various computers.

Carmen Sandiego and her gang of thieves are using their stolen time machine to loot the treasures of America's past: the first gold nugget discovered at Sutter's Mill, the manuscript of the "Star Spangled Banner," even the Statue of Liberty—nothing is safe from their evil grasp. Your mission, as a special agent of the Acme detective agency, is to track down and apprehend the crooks. You do this by collecting two kinds of clues. Some clues indicate where (and when) the bad guy has fled. The more important clues allow you to identify the bad guy, by a process of logical deduction. Within a limited number of "hours" you must collect enough clues to obtain an arrest warrant.



The Carmen Sandiego series offers a unique combination of kid humor, animation, puzzle solving, and educational content.

To help interpret the clues is a 1300-page paperback reference book, *What Happened When: A Chronology of Life and Events in America*, by Gordon Carruth (Signet, 1991). Even if you are a walking encyclopedia of American history, you'll need this book to answer an obscure trivia question before you can record your name and achievements in the detective Hall of Fame. This is the only form of "copy protection" used.

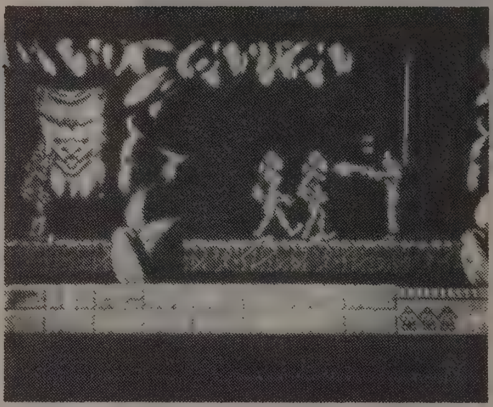
Your Chronoskimmer 450 XL has a delightfully simple control panel: simply bring up the map, click on a region of the country, click the desired era on the time line, and press the Launch button. As you solve more cases, the game becomes more difficult.

The Carmen Sandiego series offers a unique combination of kid humor, animation, puzzle solving, and educational content. The VGA graphics include many digitized photographs and art works.

The package contains six 5.25" disks (360K) and three 3.5" (720K) disks. An installer program copies the files to your hard disk, and unpacks and assembles them. When installed, the program takes up 2,127,308 bytes of hard disk space. *Where in America's Past Is Carmen Sandiego* represents the limit of what can be achieved on current personal computers using magnetic media. Works of this scope really cry out for the encyclopedic storage and retrieval capability of CD-ROM. Unfortunately, even a PC with a hard drive and a good video monitor lies beyond the budgets of many schools and families.

GOLD OF THE AZTECS

Designed By: Ray Coffey, Jack Wikeley, David Price, and Mike Hooker
Published By: US Gold
Distributed By: Accolade
For: IBM PC and compatibles (640K, 10MHz or faster recommended), also Amiga
List Price: $49.95



Five years in development, this action/arcade game includes seven thousand frames of animation, 140 different hero actions, eighteen thousand individual graphics, and over 600K of music and sound effects (Ad Lib and Roland stereo cards are supported).

Gold of the Aztecs takes place in macho Fantasyland somewhere between Indiana Jones and G.I. Joe. You have a Conquistador treasure map. You parachute into the jungles of Yucatan and overcome poison darts, coconut-throwing monkeys, man-eating flowers, and stampeding elephants. (Mexican elephants?!)

CALIFORNIA GAMES II

Programmed By: Gil Colgate, Darryl Fetzer, and others
Published By: Epyx
For: IBM PC and compatibles (512K). Joystick recommended. CGA, EGA, VGA, and Hercules graphics supported.
List Price: $39.95

Hang Gliding at Fort Funston.
Snowboarding in the Sierras.
Jet Surfing in Monterey Bay.
Bodyboarding at Santa Cruz.
Outlaw Skateboarding down the California Aqueduct.

Three 5.25" (360K) disks and two 3.5" (720K) disks. The copy protection is a "Tide Table" printed on that horrible dried-blood-colored, photocopy-resistant paper.

The keyboard controls are tricky and intricate. Consider bodyboarding for example:

Hit space to dive off the pier into the water...When the wave builds, you can execute stunts. To "spin" at the bottom of the wave, hold space along with left or right arrow keys. Do a "barrel roll" by holding left to ride the crest, hold space and quickly release left and then press

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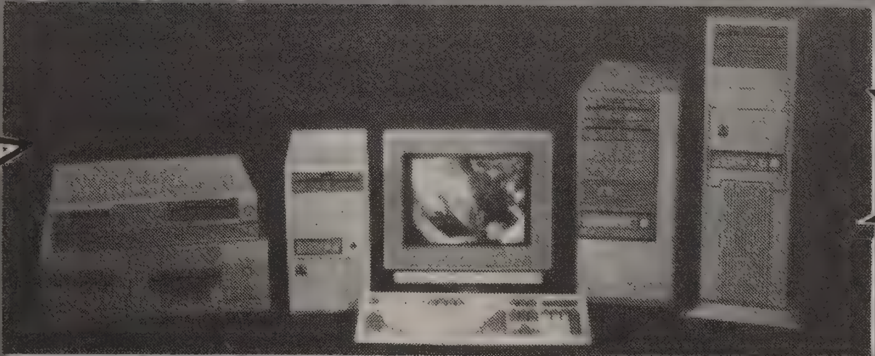

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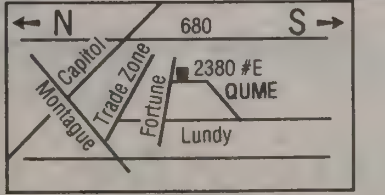

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right. Do a "cut" by holding left, quickly followed by up. The timing is critical.

Up to eight players can take turns competing in all five events for the title of Supreme Dude.

ARACHNOPHOBIA

Published By: Disney Computer Software
For: IBM PC and compatibles (CGA, EGA, and Tandy 16-color, 512K), also Amiga (512K) and Commodore (64K) versions
List Price: $49.95 ($69.95 with Sound Source)

> **Disney's first venture into adult computer entertainment is a combination of action and strategy. This game lets you spray, squash, and fry thousands of little eight-legged horrors in seven different towns.**

Developing computer games from movies is simple enough when you own the studio and a software company. In case you missed the creepy movie (with John Goodman's great comic performance as Delbert, a small-town exterminator) Arachnophobia is the story of a deadly Venezuelan jungle spider that immigrates to a rural California town and starts a family, with lethal results for the local humans.

The game is Disney's first venture into adult computer entertainment. A combination of action and strategy, the game lets you spray, squash, and fry thousands of little eight-legged horrors in seven different towns, with the chance of earning a trip to their jungle homeland. A copy of the novel is included. An optional Combo Pak includes Sound Source, an inexpensive peripheral device that provides digitized voice, music, and sound effects. This is a great idea, since thousands of MS-DOS game players who would never attempt to install a stereo card inside their computers are missing out on current advances in audio for games.

PC SOFTWARE REVIEW

INFO SELECT

Published By: MicroLogic
List Price: $149.95
Reviewed By: Birrell Walsh

Working for a computer magazine I can try out any personal information manager software that catches my interest. After two years of reviewing these software packages, I have settled on the simplest of them all.

In the morning, when I turn on the computer, the first thing I see is Info Select, my personal information manager. It is loaded whenever my computer is working, and is the last thing I use at night. I use Info Select for to-do lists, address books, bibliographies, project manage-

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ment, idea files, expense tracking, and the random notes we need to make daily.

Info Select imitates a pile of notes on the computer screen as they once appeared on your desk. Unlike the pile on your desk, it is easy to find things in the Info Select "stacks." A quick search algorithm triggered by the single letter "G" (for "get") shows a screen with one square for each note you have. With each letter of the search string that you type, the number of notes shrinks. Hit return, and the notes that have the search string in them appear on your screen.

Info Select v2 is the third generation of this product. The first was Tornado Notes, the second was the first Info Select. Each release has added new features: a tickler file to notify you of today's chores, mail-merge, auto-dialing, predefined forms, and simple character-based line drawing. The latest version has stacks that can be shared on a network, making it an amazingly simple email system.

You can install Info Select in a DESQview window or use it as a RAM-resident TSR with your other applications. The average office will figure out half a dozen uses for this software within a week. It is an excellent value. (MicroLogic, Inc., PO Box 70, Hakensack, NJ 07602. 1-800-342-5930)

IF:X BUSINESS EXPENSE REPORTS

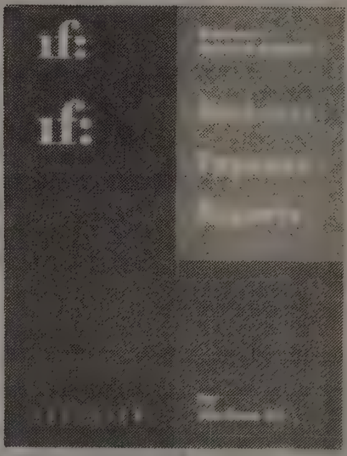
Published By: Softview
List Price: $79
Reviewed By: Woody Liswood

If you spend money on your job, need to keep a record of your spending for the IRS or reimbursement from your employer, and use Windows you may like if:X Business Expense Reports.

if:X is a set of forms used by most businesses. Completing them is a snap. Call up the form, fill in the numbers, and if:X takes care of the addition and interaction between all parts of the forms.

If you are like me and travel more than is good for you and return home with a multitude of receipts, if:X is *great*. I sit down with a pile of receipts, call up the form, and start completing it. When I come to an expense item that might require four to five entires on a single day, I no longer have to take out my calculator, add them all together, and enter a single number on the form. I just double click on that box on the form, and if:X opens a worksheet for me to enter all the appropriate numbers, dates, and explanations, then totals that worksheet and places the consolidated number on the expense form.

Dates are handled automatically. Enter the starting date for the week, and if:X then completes the rest of the dates for you. Also, there is extensive error checking. If if:X thinks that you have made an error in expense logic, it will let you know when you go to print the form.



if:X comes with five different varieties of expense forms. You will need to investigate each of them and use the one you like best, or which best matches the systems used by your accountants, to track these items. if:X

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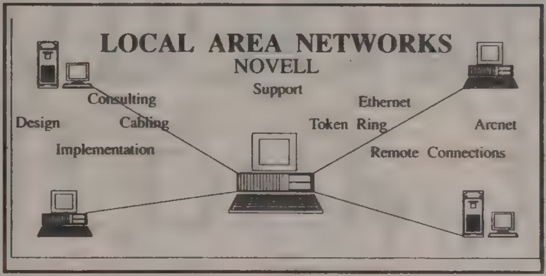

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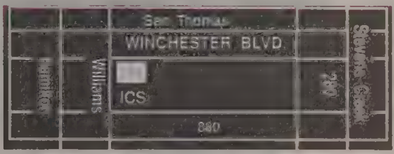

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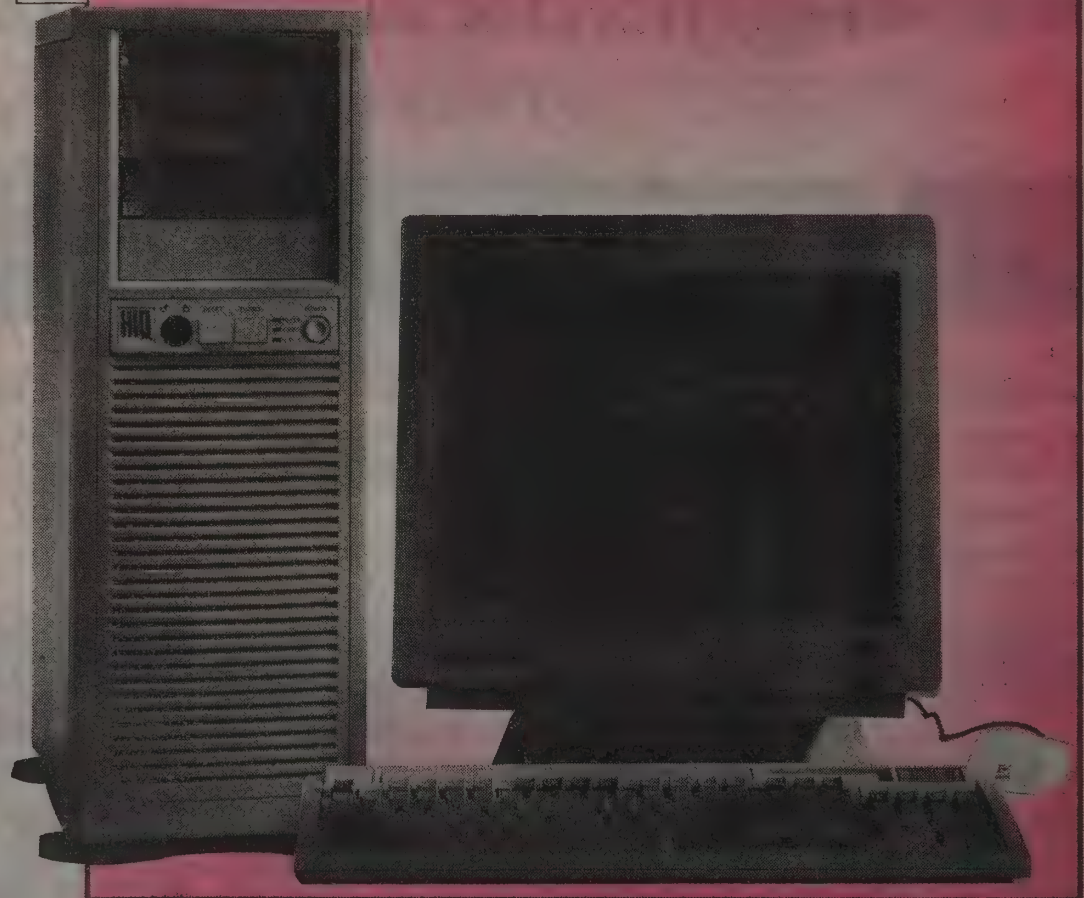

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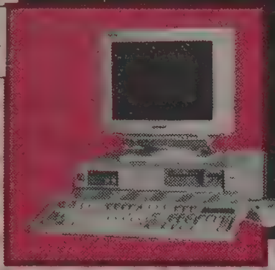

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ADDRESS BOOK PLUS V3.0

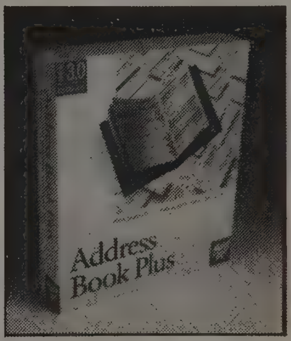
Published By: Power Up Software
List Price: $79.95 (Macintosh version, $89.95)
Reviewed By: Woody Liswood

Do you keep a Name and Address (NAD) book handy? Do you like to have your book done in multiple formats such as Day Timer, Rotary Cards, and labels? Do you need to dial the phone from your computer-based NAD?

Address Book Plus 3.0 adds more capacity and features to a program that was already one of the best. This version offers better support for different page sizes, preprinted forms, and typefaces. It now supports proportional printing, boldfaced fonts, and shading on laser printers. Unfortunately, it still doesn't support postscript printing which is a major drawback in my opinion.

It now supports four phone numbers: Home, Work, Fax, and Other. While this is great, it is missing a field for the position title of the person. There are fields for Profession and Comments which can be used for title, but are not as handy as a real title field. This will make the program slightly less handy as a business-oriented program than it could be.

Importing and exporting files is easy. I prefer moving data around using comma-delimited files, and Address Book Plus worked fine with files that I had outputted from Packrat.



From a business viewpoint, the ability to print in a wide variety of formats is a major plus. Also, since Power Up sells pre-printed laser and continuous feed forms to match up with the various supported formats, you can create a professional looking NAD file rather easily.

All in all, Address Book Plus is a feature-laden upgrade to a popular program. It is more oriented for the home than for business, but it will do a yeoman's job in either case. (Power Up Software Corp., 2929 Campus Dr., San Mateo, CA 94403. 415/345-5900)

AFTER DARK FOR WINDOWS

Published By: Berkeley Systems
List Price: $49.95
Reviewed By: Norm Howard

The famous flying toaster squadron flaps right into Windows 3 in this release from Berkeley Systems. In addition to the airborne appliances, the collection includes a colorful assortment of aquatic creatures, lightning-struck skyscrapers, clocks, assorted mathematical and geometric constructions, type-your-own messages, and lots more all intended to protect your valuable monitor screen from the heartbreak of burn-in and provide some visual amusement along the way.

The usual "install" program adds an After Dark icon and control panel to your Windows display. It also offers the choice of in-

Continued

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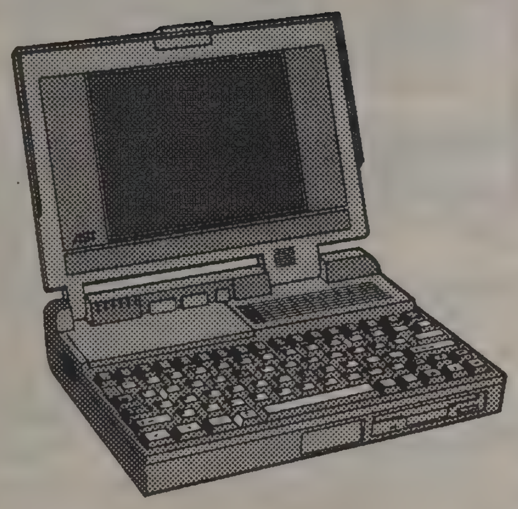

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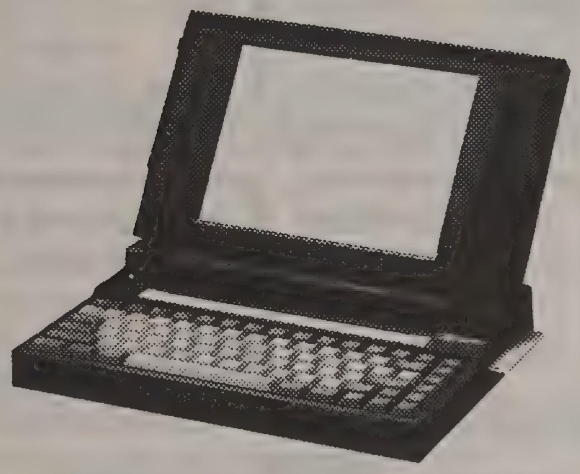

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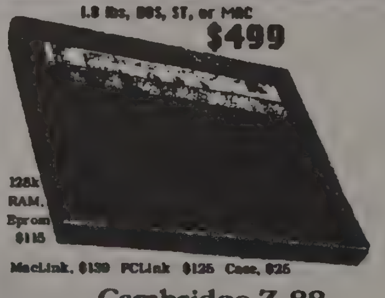

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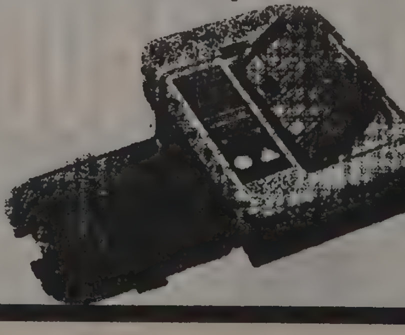

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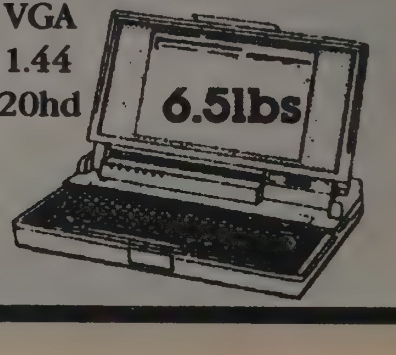

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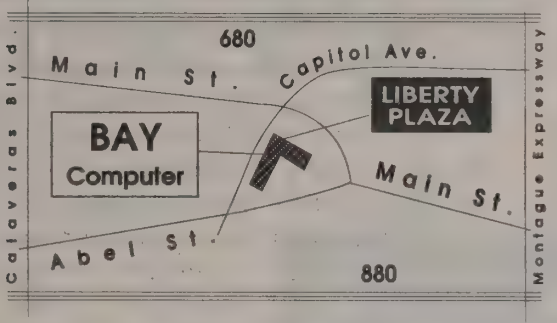

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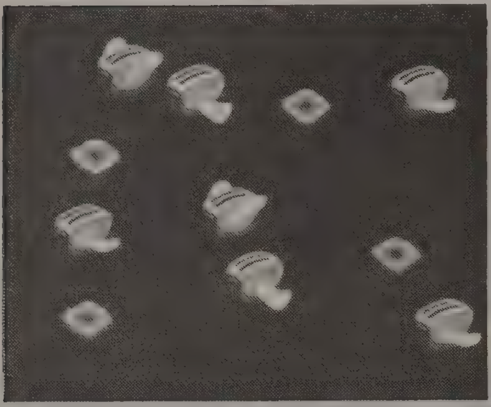
stalling a plain vanilla screen blanker that works with DOS programs invoked outside Windows. With the control panel you can select and preview any of the available display modules. My copy of the program includes thirty-six such choices, including some that can be tailored by the user to include personal messages, graphics, etc. Berkeley Systems' documentation includes a programmer's manual so that power users can create their own screen saver displays. The company suggests that it will consider including users' creations in subsequent releases.



After Dark runs the screen saver display you have chosen whenever your keyboard or mouse is untouched for the length of time you have chosen. This works for Windows applications and for DOS applications invoked from Windows. DOS applications started from the DOS command line will be blanked by the program, but you will not get the animated display.

One important caveat not mentioned on the outside of the After Dark for Windows package is that this version of the program requires that Windows be installed on your system—DOS screen blanker cannot be installed on non-Windows systems. An addendum to the documentation in my copy of the program also warns that it does not work with EGA monitors.

On my 16MHz 386 machine, After Dark performs its assigned function with no detectable effect on application software. It's fun and easy to use. (Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709. 415/540-5535)

ADOBE TYPE MANAGER & TYPE ALIGN

Published By: Adobe Systems
List Price: Type Manager, v1.1, $99; Type Align, v1.0, $99
Reviewed By: Lenny Bailes

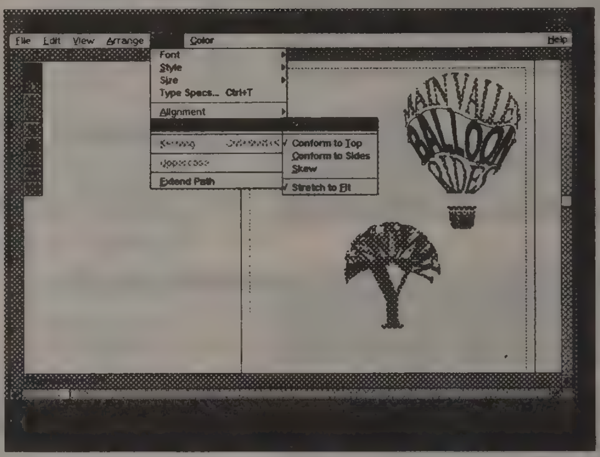
Adobe Type Manager and Type Align are a team of inexpensive utilities that lift Microsoft Windows into Macintosh-class desktop publishing.

Type Manager renders clean, high-quality screen fonts and converts Adobe PostScript typefaces for use with all other Windows-supported printers. If you don't own a PostScript Printer now, but may buy one in the future, Type Manager lets you plan ahead. You can buy PostScript typefaces and use them immediately with a dot matrix, inkjet, or HP-compatible laser printer.

Type Manager scales PostScript fonts to any point size between 1 and 128, automatically. The hard disk space used by Type Manager and Adobe's PostScript font outlines is much less than the space used for equivalent bitmapped Hewlett Packard fonts. One PostScript font outline produces type in any point size. Hewlett Packard soft fonts for the LaserJet II/IIp must be generated and stored separately for each point size.

Type Manager installation is painless. Once you've installed it, you just restart Windows. (Windows must run in Standard or Enhanced mode for Type Manager to become active). You see an immediate, dramatic improvement in the way text appears on the screen, particularly in large point sizes. Font outlines for the standard Times and Helvetica typefaces are included with your purchase. Adobe's object is to get you to go buy more Adobe typefaces after you see what Type Manager does with Times and Helvetica. It's a tempting deal.

Type Manager is one of several Windows utilities that convert PostScript outlines into rasterized type for non-PostScript printers. Bitstream's Facelift for Windows offers the same font conversion and high-resolution screen fonts, but requires Bitstream's proprietary font outlines instead of Adobe's. Z-Soft's Sofftype offers font conversion between most current PostScript formats, but does not include high-resolution screen fonts.



LaserJet III/IIIp printers include five scaleable outline fonts already built into the printer. If five fonts are enough to meet all publishing requirements, LaserJet III owners may not feel the same need to purchase Type Manager.

But you need Type Manager to use Type Align, Adobe's companion package.

Type Align is a wonderful utility which can create state-of-the-art PostScript typographic tricks. Text can be fitted to a curve, wrapped around a circle, rotated and distorted, or used to create special designs. Type Align supports these special text effects only with Adobe Type I PostScript font outlines.

Basically, Type Align duplicates the text-manipulation features in high-end drawing packages like CorelDRAW and Micrografx Designer. You draw a regular or irregular line, rectangle, or ellipse and then type text that will conform itself to the path. The individual letters can be grouped and ungrouped; you can skew, stretch, shrink, or rotate letters by manipulating their bezier handles.

Type Align's program window can be made transparent and then superimposed over any other Windows application. You can preview how Type Align output will appear in another program's document. The Type Align output is pasted into other Windows applications through the clipboard, or saved to disk and imported later. Type Align can save work in Encapsulated PostScript or Windows Metafile formats.

The standard Type Align package includes thirteen sample type design effects to show you what it can do. The manual also includes an attractive section of sample art to show you how Type Align can be used in conjunction with Adobe Illustrator or other drawing programs

Type Align requires Adobe Type Manager, v1.1 to work. Users of ATM v1.0 may request an upgrade from Adobe. (Adobe Systems, Inc., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039. 415/961-4400)

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Monitor Options

Mono Monitor with Card	$95
VGA Monitor with 16 bit Card	320
Super VGA (1024x768) VGA Monitor with 16 bit Card	390

386-25MHz
(0 WAIT STATE)

- ▼ Main Memory 1 MB
- ▼ Expandable to 2 MB/4 MB/8 MB
- ▼ Support Coprocessor Intel or Weitek
- ▼ 2/Serial 1/Parallel 1/Game Port
- ▼ 101 Extended Keyboard
- ▼ 1.2 MB TEAC Floppy Drive
- ▼ 1:1 Interleave Controller with 28MS 40 MB Hard Drive

$950

Monitor Options

Mono Monitor with Card	$95
VGA Monitor with 16 bit Card	320
Super VGA (1024x768) VGA Monitor with 16 bit Card	390

386-16SX
(0 WAIT STATE)

- ▼ Main Memory 1 MB (EMS On Board)
- ▼ 8 Slots and Socket for Intel 80387 SX
- ▼ 200 W Approved Power Supply
- ▼ Real Time Clock with Battery Backup
- ▼ 2/Serial 1/Parallel 1/Game Port
- ▼ 101 Extended Keyboard
- ▼ 1.2 MB TEAC Floppy Drive
- ▼ 1:1 Interleave Hard Drive Controller with 40 MB Hard Drive

$720

Monitor Options

Mono Monitor with Card	$95
VGA Monitor with 16 bit Card	320
Super VGA (1024x768) VGA Monitor with 16 bit Card	390

286-12 MHz
(0 WAIT STATE)

- ▼ Main Memory 1 MB (EMS On Board)
- ▼ 8 Slots, and Socket for Intel 80387
- ▼ Foot Print LED AT Case
- ▼ Real Time Clock with Battery Backup
- ▼ 2/Serial 1/Parallel 1/Game Port
- ▼ 101 Extended Keyboard
- ▼ 1.2 MB TEAC Floppy Drive
- ▼ 1:1 Interleave Hard Drive Controller with 40 MB Hard Drive

$570

Monitor Options

Mono Monitor with Card	$95
VGA Monitor with 16 bit Card	320
Super VGA (1024x768) VGA Monitor with 16 bit Card	390

1 Year Parts/1 Year Labor Warranty On All Systems

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CITIZEN 200-GX

- ▼ 9 Pin for true letter quality
- ▼ 192 cps
- ▼ Color Upgradable
- ▼ 2 Year Warranty

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Color Option . . . $59

CITIZEN™ GSX-140

- ▼ 24 Pin for True Letter Quality
- ▼ 192 cps; 64 cps LQ
- ▼ LCD Front Panel Display
- ▼ 2 Year Warranty

$299

Color Option . . . $59

CITIZEN GSX-145

- ▼ 24 Pin for true letter quality
- ▼ 192 cps
- ▼ 132 Column Printer
- ▼ 2 Year Warranty

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Color Option . . . $59

TRACKMAN
LOGITECH

- ▼ 300 dpi resolution
- ▼ Requires little desk space
- ▼ Thumb ball for extra comfort
- ▼ Small ball for extra precision

Serial mouse C9 320 dpi	$75
Bus mouse C9 320 dpi	$85
Serial TRACKMAN 320 dpi.	$85^{95}
Bus TRACKMAN 320 dpi.	$85^{95}
SCANMAN PLUS	$179
Catchword	$125

RODIME HARD DISKS

RO3128A 100 MB 19ms IDE	$469

ADD ON BOARD

AT I/O Card 2S/1P/1G	$25
Mono Graphic/Printer	25
Color Graphic/Printer	35
XT High Density Floppy Cont	35
XT Hard Disk Cont	49
EGA Card	79
MFM 1:1 HD/FD Cont	69
IDE Dual HD/FD Cont.	35
SCSI 1:1 HD/FD Cont	275
RLL 1:1 HD/FD Cont	98
Orchid Pro Designer w/1 MB 1024x768 Fastest VGA Card	269

INTEL MATH CO-PROCESSORS

80287-10 For 286 System	$225
387 SX-16	315
387 DX-20	350
387 DX-25	440
387 DX-33	540

FLOPPY DRIVES

360K/1.2 MB Floppy Drive 5¼"	$60/70
720K/1.44 MB Floppy Drive 3½"	60/70

MAXTOR HARD DISKS

MT-7080A 80 MB 18ms IDE	$429
XT-1085 71 MB 28ms MFM	549
XT-4170 158 MB 14ms SCSI/ESDI	895/850
XT-4380 338 MB 16ms SCSI/ESDI	1295/1295
XT-8760 768 MB 16ms SCSI/ESDI	1850/1850

QUANTUM HARD DISKS

PRO80 AT 80 MB 19ms IDE	$469

NEC HARD DISKS

NEC D-3142 65 MB 23ms 3½ RLL	$299
NEC D-3661 110 MB 18ms 3½ ESDI	589
NEC D-5655 150 MB 18ms 5¼ ESDI	679

SEAGATE HARD DISKS

ST-225 20 MB.	$189
ST-251-1 40 MB 28ms	249
ST-4096 80 MB 28ms	549

WESTERN DIGITAL

40 MB IDE 28ms w/Cont	$269
80 MB IDE 18ms w/Cont.	489

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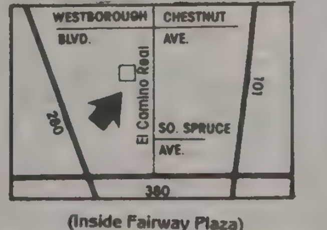

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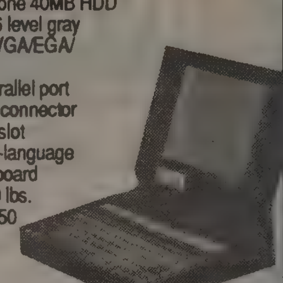


- 80386SX-16 Intel microprocessor • AMI BIOS
- 2MB SIMM expandable to 6MB
- One 3.5" FDD & one 40MB HDD
- LCD display w/16 level gray scales mono w/VGA/EGA/CGA support
- 1 Serial and 1 parallel port
- Ext. video (VGA) connector
- Internal modem slot
- 85/86 keys, multi-language ALPS tactile keyboard
- Weighs only 10.9 lbs.
- Travel bag add $50
- Extra battery pack add $69

MICRO-L® 486-25/33 EISA Cache $2,395

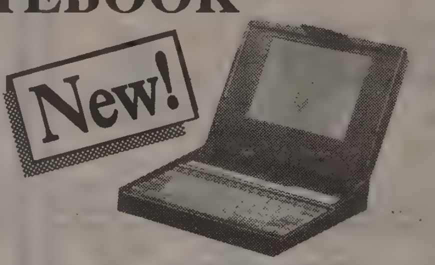
- Intel 80486-25MHz CPU, Lndmk: 111.80 MHz
- 64KB Cache memory expandable to 256k'
- 4MB RAM expandable to 64MB on-board
- Supports external Weitek 4167
- AMI/Award 486 BIOS supports shadow RAM
- 1.2MB and 1.44MB Foppy drives (TEAC)
- 2 serial/1 game/1 parallel ports
- IDE Hard/Floppy Disk Controller
- Keytronics 101 keyboard (USA)
- Tower case w/7 bay drive/digital display /230W P/S
- MS-DOS 3.3 or 4.01
- MS-Windows 3.0
- **33MHz (Lndmk : 146.50, MIPS: 14.489) add $220**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440**	14" Multiscan 1024 x 768 Sony 1304**
Basic System	2,395	2,810	3,080	3,205
WITH HARD DRIVE				
80MB - IDE, 19ms	2,720	3,135	3,405	3,530
120MB - IDE, 19ms	2,765	3,180	3,450	3,575
210MB, 16ms - IDE	3,,085	3,500	3,770	3,895
338MB, 16ms - ESDI*	3,610	4,025	4,295	4,420

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIe - 1MB

PC NOTEBOOK



Architecture	IIBM PC/AT compatible (AMI BIOS)
CPU	80386SX 16MHz Runs at 8/16MHz software selectable
Co-Processor	80387SX (End-user installed option)
Core Logic	Toshiba
DRAM Memory	Basic 2.0MB, expandable to 4.0MB EMS support (LIM 4.0)
I/O Interface	RS-232C x 1 (Async, 9-pin) External 5.25" FDD/Printer port VGA Output (15-pin) PS/2 compatible port External 101/102 keyboard adaptor for mouse port External expansion box port
I/O Slot	Expansion memory slot x 2MB (End-user selectable option)
Disk Drive	3.5" FDD x 1 (1.44MB) 2.5" HDD x 1 (20MB) (40MB & 60MB HDD available soon!)
Power Supply	Cartridge type Ni-Cad battery with external AC Adaptor/Recharger
Screen	VGA compatible screen (640 x 480 dots) Black & White LCD with Backlit (CCFT) 16/32 Gray Scales
Keyboard	Super Low-Profile 80/81 Keys (101/102 keys emulation)
Modem Slot	Internal modem/FAX slot (End-user installation option)
Dimensions	11.0" x 8.5" x 1.98" (W x D x H)
Weight	6.3 Lbs.Includes HDD, FDD & Battery

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JAPANESE
Motherboard: TOSHIBA
LCD: EPSON
Battery: SANYO
FDD: MATSUSHITA
Inverter: EPSON

Keyboard: ALPS
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80386SX 20MHz - Coming Soon!

MICRO-L® 486-25 /33AT Cache $1,695

- Intel 80486-25MHz CPU, Lndmk: 114.10 MHz
- 64KB Cache memory exp to 256k
- 4MB RAM expandable to 16MB on-board
- Supports external Weitek 4167
- AMI/Award 486 BIOS supports Shadow RAM
- 1.2MB and 1.44MB Floppy drives (TEAC)
- 2 serial/1 game/1 parallel ports
- IDE Hard/Floppy Disk Controller
- Keytronics 101 keyboard (USA)
- Tower case w//7 bay drive/digital display/230W P/S
- MS-DOS 3.3 or 4.01
- MS-Windows 3.0
- **33MHz (Lndmk: 149.60, MIPS: 14.597) add $220**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440**	14" Multiscan 1024 x 768** Sony 1304
Basic System	1,695	2,110	2,380	2,505
WITH HARD DRIVE				
80MB - IDE, 19ms	2,020	2,435	2,705	2,830
120MB - IDE, 19ms	2,065	2,480	2,750	2,875
210MB, 16ms - IDE	2,385	2,800	3,070	3,195
*338MB, 16ms - ESDI	2,910	3,325	3,595	3,720

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIe - 1MB

MICRO-L® 386-33/Cache $1,260

- Intel 80386-33MHz CPU, Lndmk: 58.7MHz/, MIPS: 7.89
- 4MB RAM exp. to 16MB on-board • TI™ Chipset
- AMI BIOS • 80387 Weitek 3167 co-processor socket
- 64k Cache on-board, w/cache controller
- True OS/2, XENIX, MS DOS, & Novell compatible
- IDE Hard/Floppy Disk Controller
- 1.2 MB and 1.44MB FDs (Teac)
- 2 seria/1 parallel ports
- Keytronics 101 keyboard (USA)
- Tower case w/7 bays/digital display w/230W P/S
- MS DOS 3.3 or 4.01 /MS-Windows 3.0
- **Optional Mobo w/SIS™** Chipset, upto 16MB-less $80

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440**	HiRes VGA** 1024 x 768 Sony 1304
Basic System -	1,260	1,675	1,945	2,070
WITH HARD DRIVE				
80MB - IDE, 19ms	1,585	2,000	2,270	2,395
120MB - IDE, 19ms	1,630	2,045	2,315	2,440
210MB - IDE, 16ms	1,950	2,365	2,635	2,760
338MB , 16ms - ESDI*	2,475	2,890	3,160	3,285

*Maxtor Drive w ESDI contr w/32k Cache ** ORCHID ProDesigner IIe- 1MB

MICRO-L™ 386-25 $995

- Intel 80386-25MHz CPU, Lndmk: 30.0MHz
- True OS/2, XENIX, MS DOS, & Novell compatible
- 4MB RAM expandable to 8MB
- 80387 co-processor socket
- 1.2 MB and 1.44MB FDs (Teac)
- 1:1 interleave controller or IDE
- AMI BIOS, NEAT™ Chipset
- 8 expansion slots/2 serial/1 game/1 parallel ports
- Keytronics 101keyboard (USA)
- 6-drive Baby AT case w/ UL 200W power supply
- MS-DOS 3.3 or 4.01
- MS-Windows 3.0

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	14" VGA 640 x 480 Relisys	14" SVGA 1024 x 768 0.28 dp	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	995	1,335	1,410	1,680
WITH HARD DRIVE				
52MB - IDE, 27ms	1,245	1,585	1,660	1,930
80MB - IDE, 19ms	1,320	1,660	1,735	2,005
120MB - IDE, 19ms	1,365	1,705	1,780	2,050
210MB - IDE, 16ms	1,685	2,025	2,100	2,370

MICRO-L® 386-SX $695

- Intel 80386/SX-16 CPU runs 16MHz
- 80387 co-processor socket
- 2MB RAM expandable to 8MB
- 1.2 MB and 1.44 MB floppy drive (Teac)
- AMI BIOS, NEAT™ or VIA™ Chipset
- 1:1 interleave HD/FD IDE controller
- 8 expansion slots/2 serial/1 game/ 1 parallel ports
- Keytronics 101 keyboard (USA))
- 6-drive Deluxe baby-AT case w/ 200W UL power supply
- MS-DOS 3.3 or 4.01
- MS-Windows 3.0
- 386/SX-20MHz add $60

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	12" Mono 720 x 350	14" VGA 640 x 480 Relisys	14" SVGA 1024 x 768 0.28 dp
Basic System -	695	795	1,035	1,110
WITH HARD DRIVE				
52MB - IDE, 17ms	945	1,045	1,285	1,360
80MB - IDE, 19ms	1,020	1,120	1,360	1,435
120MB - IDE, 19ms	1,065	1,165	1,405	1,480
210MB - IDE, 16ms	1,385	1,485	1,725	1,800

MICRO-L® 286-12 $345

- Intel 80286-12.5MHz CPU
- True OS/2, XENIX, MS DOS, and Novell compatible
- 80287 co-processor socket
- 1MB RAM expandable to 4MB
- 1.2 MB floppy drive (Teac)
- 2 HD/2 FD IDE controller
- 2 serial/1 game/1 parallel ports
- 101 Enhanced keyboard
- 6-drive Baby AT case w/ UL 200W power supply
- **16MHz add $40**
- **20MHz add $55**
- **25MHz add $70**

STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video Monitor	12" Flat Mono 720 x 350	14" VGA 640 x 480 Relysis	14" VGA 1024 x 768 0.28 dp
Basic System -	345	435	685	760
WITH HARD DRIVE				
52MB - IDE, 17ms	595	695	945	1,010
80MB - IDE, 19ms	670	770	1,020	1,065
120MB - IDE, 19ms	715	815	1,065	1,130
210MB - IDE, 16ms	1,035	1,135	1,375	1,450

MOTHERBOARDS

486-33 EISA w/64K Cache/up to 64MB	$1,945
486-25 EISA w/64K Cache/up to 64MB	$1,720
486-33 AT w/64K Cache/up to 16MB	$1,220
486-25 AT w/64K Cache/up to 16MB	$995
386-33 EISA w/64K CACHE w/CPU-	$1,055
386-33 w/64K CACHE w/CPU- TI upto 64MB	$560
386-33 w/64K CACHE w/CPU- SIS upto 16MB	$465
386-25 w/CPU - ECS	$380
386-SX/20 NEAT - ECS	$285
386-SX/20 VIA	$285
386-SX/16 NEAT - ECS	$245
386-SX/16 VIA	$245
286-25 w/CPU - SOLUTION	$175
286-20 w/CPU - SOLUTION	$160
286-16 Solution/ VLSI	$145
286-12 VLSI	$119

HARD DRIVES

Maxtor XT-7080A 81MB IDE	$315
Maxtor LXT-213A 213MB IDE	$620
Maxtor XT-4170E/S 158MB	$735
Maxtor XT-4380E/S 338MB	$1055
Maxtor XT-8380E/S 360MB	$1075
Maxtor XT-8760E 768MB	$1595
Maxtor XT-8760S 768MB	$1620
Conner CP-30104 120MB	$370
Conner CP-3204 200MB	$588
Quantum LPS52A 52MB 17ms 1"	$250
Quantum ProDr80A 84MB,19ms,3.5"	$325
Quantum ProDr105AT 105MB,17ms,3.5"	$370
Quantum ProDr210A/S 210MB,14ms	$690
Western Digital 93044 40MB IDE	$174
Ultrastor 12F ESDI Controller w/32K Cache	$160
Adaptec 1542B-Kit SCSI Controller FD/HD	$275

MONITORS

Relisys VGA RE-9513 640 x 480	$290
Relisys VGA RE-9514 1024 X 768 0.28dp	$315
Relisys VGA Gry-Scl RE-9503	$129
Relisys VGA 1024X768 RE-1420	$345
Seiko VGA 1024X768 CM-1440	$475
Seiko VGA 1024x768 CM-1450	$595
Seiko 20" VGA 1280 x 1024 CM-2050	$1795
Sony VGA 1024x768 1304	$620
NEC 3-D Multi-Sync 1024 X 768	$589
Nanao 16" VGA 1024x768 9070-U	$935
Nanao 16" VGA 1024x768 9080-I	$1195
Sigma Design LaserView 19"	$1560
Genoa VGA Card 6400 (512K)	$100
SpeedStar Plus VGA 1MB	$190

LASERJET MEM UPGRADES

JetRam II, IID, IIP, III -1/2/4MB	$95/130/210

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Panasonic KXP-1180 9-pin	$151
Panasonic KXP-1123 24-pin, 192cps	$239
Panasonic KXP-1124i 24-pin 240cps	$279
Panasonic KXP-1624 24-pin	$362
Citizen GSX-140 24-pin	$279
Citizen GSX-145 24-pin	$395

MISCELLANEOUS

TEAC 1.2/1.44 MB FD	$65
Logitech MouseMan Serial/Bus mouse	$65/77
FAX modem 2400send	$75
FAX modem 9600send-Recv & software	$175
U.S Robotics modem 9600SD int/ext	$540/585
Colorado DJ-10 Jumbo Tape Back-up 120MB	$245
Colorado DJ-20 Jumbo Tape Back-up 250MB	$320
Archive ARC-150i Tape Back-Up 250MB	$850
MS DOS 3.3/4.01	$65
MS Window 3.0 w/DOS	$115
Keytronics 101 keyboard	$45
Focus 2001 Keyboard	$45
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1.44 Floppies at Unheard-of Prices!

Get 'em while they last! 1.44 MB Fujitsu Floppy drives at blow-out prices! These Model M2537K-19A half-height drives used to be $149.00, then were $99.00, now you can get new ones (black bezel only) for an amazing $49.00 each! Or you can get a used but guaranteed good drive for $39.00! These do not come with 5 1/4" mounting kits, but check for availability, we may be able to round some up. Need a floppy controller for your AT? How about a brand new Western Digital WD1002A-FOX for $15.00? New in OEM packaging (no pretty box), no cables. Act now, they won't last long when word gets out!

Fujitsu M2537K-19A Floppy drive New HSC#12391 $49.00 Used HSC#12393 $39.00

WD1002A Floppy Controller HSC#12392 $15.00 90-day warranty on these drives and controller.

Everex Magic I/O Card for AT's...

...at a magic price! These I/O cards quickly and inexpensively answer your needs for ports on your AT. This one card provides a parallel port and a high-speed AT serial port, and has room for another serial port (optional with Second Serial Kit). Port addresses and interrupts are selectable for configuration with nearly every IBM compatible system, and a diagnostic/setup utility is included on disk. Genuine Everex quality at an off-brand price!

Everex Magic I/O EV170A	**HSC#12341**	**$17.50**
Everex Second Serial Kit	**HSC#12351**	**$4.95**

EVEREX

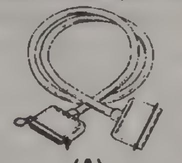
20 MB Conner SCSI Hard Drive Special!

Those of you looking for an inexpensive second SCSI Hard Disk Drive will want to look no further! Those of you who are in-the-know will recognize the name Conner Peripherals as a manufacturer of rugged, high-quality disk drives. These low-profile 3.5" drives (model CP3020) are only 1" tall! They are a 2-head, 626-cylinder configuration and have a 25 mS access time. These drives are like new, having been pulled from unused equipment, and carry a 90-day HSC warranty. HSC #12385

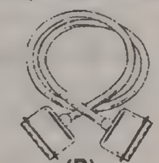
$129.00

HSC has SCSI Cables & Terminators to get you connected!

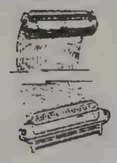
Now that you have acquired that SCSI Device for your computer, you need some way to connect it, don't you? We have gathered a collection of SCSI interconnect hardware to make your job easier! The first item below (A) is a high quality "Mac" SCSI Cable, 18" long, fully shielded, with a DB25 Male connector on one end and a 50-pin Micro Ribbon connector on the other. Our price? $7.95! The second item (B) is a standard 6 ft. SCSI interconnect cable with male 50-pin Micro Ribbon connectors on both ends. It sells for $11.95, a savings of over $6.00 from our normal retail price. Item (C) is a handy cable when installing a SCSI Drive that is equipped with a 50-pin header, namely a ribbon cable that goes from an IDS50 socket to a ICN50S Socket. It is only 5" long, so your enclosure won't be filled with a folded cable. It sells for $5.95. Your SCSI Bus must be terminated somewhere, usually on the last device, so that is where the last item comes into use. If your last SCSI device has two conncetors (for daisy-chaining), use item (D), a single ended terminator on the open connector. Be careful, though, as some SCSI devices are internally terminated. Consult your device manual before cabling. We have a large quantity of these single ended terminators, which are genuine Amphenol part #200-1S000-05000, so we are offering them at the new, low price of $6.95, or ten for $49.00! System installers take note!



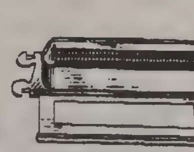
(A)
18" Mac SCSI Cable
HSC # 12029
$7.95



(B)
6' SCSI Interconnect Cable
HSC #12355
$11.95

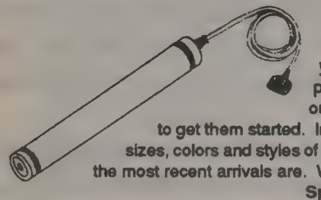


(C)
5" SCSI Ribbon Cable
HSC #9625
$5.95



(D)
Single-ended SCSI Terminator
HSC #11397
$6.95 or 10/$49.00

Attention: High Quality He-Ne Lasers for Serious Users



We would like to point out that HSC has been selling lasers to hobbyists for over 15 years, so you know that when we offer them in an ad, they are going to be worth your time to consider. Our latest offerings are from Spectra-Physics, one of the most respected names in Helium-Neon (He-Ne) lasers. These are housed in attractive painted aluminum tubes (16 1/4" x 1 3/4") with shutters, and have a six-foot power cord terminated in a three-pin AMP circular connector. These tubes have a power output of roughly 5 mW (red beam), and require approximately 1kV @ 6 mA to operate. Of course, like all He-Ne's, a high voltage "kick" of roughly 3 kV or so is required to get them started. Inquire about our power supplies to go with this tube. We have both AC and DC input types, including our own AC operated supply in kit-form. We also have other sizes, colors and styles of He-Ne tubes in stock (including green and orange), and occasionally other media, such as Argon (green) or Helium-Cadmium (blue). Call or stop by to find out what the most recent arrivals are. We also carry varied optics and related hardware for the experimenter, instructor, holographer and light-show operator. Call for warranty information on lasers.

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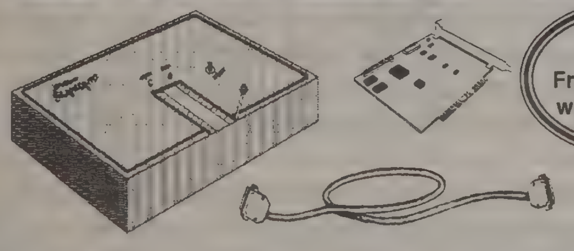

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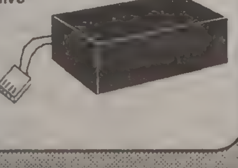
Is your AT Losing its Memory?



If your AT is acting strangely, it could be that its battery is weak! The internal battery that supplies power to the CMOS RAM typically has a life of one to five years...so it is easy to forget it is there. Then when it dies, you wonder why your computer can't find its hard drives, or the internal clock, or the extended memory. The answer is as simple as removing the cover, unplugging the old battery and installing the new one. These 4.5 Volt Alkaline Ray-o-Vac Computer Clock Batteries are 1" x 3/4" x 2 1/4" in size and brand new in blister packs. HSC #12340 **$3.95**

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Continued from page 49

uct comes out, "Our clients want us to test it, make sure it works, before they get it; they want a verified copy sent to set up and go on their machines, without all the debugging and customizing that used to go on."

That's the experience at UC Berkeley's electronics research lab, another Cygnus customer, where free software is the development environment of choice. "This software is central to everyone's research work," says Wendell Baker, a graduate student working for the lab. "We found that there were five of us spending 40% of our time making sure that we kept the support of these tools updated."

What sold Berkeley on Cygnus? "I told my professors that unless we used Cygnus me and a bunch of other guys weren't going to graduate," says Baker.

BUT WHAT ABOUT VIRUSES? AND OTHER LINGERING DOUBTS

You hear talk. Companies are hesitant to use free software, both because it's free and because, according to one industry pundit, it's "an implicit insult to people who charge for their software." David Stang, director of research for the National Security Computer Association, says that free software spooks some people "because of its assumed association with virus-ridden software."

But the GNU products are strictly controlled to ensure their free status, and a side benefit of the availability of source code is that it's easier to detect viruses.

There's a larger benefit: everyone benefits from work Cygnus does for its customers. "Any time we develop a certain feature specifically for a customer, that upgrade or new development or new port goes right back to the public," says Gilmore. This is the trickle-down effect of technology. It's what made Tang, the "drink of astronauts" so phenomenally popular. Developed for NASA, Tang became available to the mass market. (The microprocessor also lept into the technological mainstream as a result of NASA research and development.) The fact that any custom work done by Cygnus for NASA also becomes instantly available to the larger UNIX community "thrills NASA to no end," says Woodrow. "The fact that we can fund improvements to the software that ultimately benefit everyone is a win-win situation."

As Gilmore likes to say of the Cygnus work, "It sneaks into niches that turn out to be huge markets two or three years later." Such is the work Cygnus has done for chip makers whose products go into embedded systems.

Take for example Phillips's "life chip" project, a new processor chip architecture called the long instruction format. The idea involves 100-bit or 200-bit-wide instructions that are used in multiple different functional units inside, somewhat like microcode, except that in this case the microcode is produced by a compiler directly from C or C++ code and downloaded into the chip.

The idea is that the chip can be used for custom application. For example, say you're a developer using the life chip and trying to do some sort of digital signal processing, and you need something faster than the average DSP. You code up your algorithms in C and feed to the life version of the GNU C compiler, which Cygnus built for them and which Phillips gives you—free—when you purchase the development package.

You give the compiler a little configuration file that says, "Assume three integer adders, one floating point adder, one floating point multiplier, thirty-two registers, and XYZ kind of interface to memory; crank it through and see what the performance is in a simulator." If you don't like it, change to a second floating point multiplier. That doesn't work? How about a second port to memory? When you finally get something back that meets your performance and cost requirements, you take the output of the compiler and have Phillips compile it into a ROM on the chip. Phillips then builds a chip with exactly the functional units you need.

You have a nice one-chip cheap solution, courtesy of Phillips and the compiler, custom made for them by Cygnus.

Just how much of a bargain is something like the Phillips compiler? Chip maker AMD paid two companies $400,000 to build a compiler and port the GNU tools for its 29000 chip (used in the HP LaserJet, among others). This work was done in spite of the fact that Richard Stallman, founder of the Free Software Foundation, bid to develop the compiler for AMD at one-tenth of what they eventually paid.

The grey-suited thinking behind the decision to go with the commercial companies was that if there was a free compiler built (and Stallman's version would have been, under the free software ideology) there would never be a market for it, and thus no one would support it. But the story doesn't end there.

There's been a change of mindset at AMD; they now ship the GNU tools and are a customer of Cygnus. Why the change?

"Partly now that free software is supported; partly that they've seen it's now a mature product," says Gilmore. "Intel ships GNU tools with their stuff, Data General ships it with every workstation. NeXT ships GCC with every machine. They've realized that it's a serious alternative."

What the bean counters hadn't considered was a marketing plan that involved giving away the compiler. But the business these chip makers are in is selling chips. And when they focus on that, it really makes a lot of sense. It's never really been an option for them before. "After all, they didn't want to give away something they previously paid $400,000 for," says Gilmore.

In a gloomy economic atmosphere it seems strange to pay for the support and development of something that you can't hold onto. Any new features or implementations made by Cygnus for one company can immediately be used by its competitor, whether or not that competitor is a Cygnus customer. After all, the free software has a built-in international distribution channel in the form of the Internet.

Some, of course, will say, "Well, I'll just sit back and let my competitors pay for the Cygnus support, and I'll reap the benefits." However, such people, while able to ultimately benefit from developments released to the world, do have to wait. Cygnus customers get those improvements immediately.

Additionally, while Cygnus is throwing its impressive collective knowledge base behind a product, another company will have to rely on its in-house UNIX wizard to pick up the change, assuming that she will have time to adequately perform the job she was originally hired to do. That's a big leap of faith, and frankly, one that Cygnus is counting on to propel them into being a major force in the support market.

"The fact is that our prices are competitive with keeping a person on staff full time," says Cygnus's Wallace. "And yet we come into sites where people are doing just that, spending forty or sixty hours a week maintaining the software."

Also, as part of the Cygnus support package, you can dictate specific improvements or changes to the software that meet your immediate needs. As any developer knows, nothing slows up productivity more than not having the right tools, or having tools that don't work. For Cygnus clients, who frequently describe the service in terms like "win-win situation" and "the best of both worlds," this problem is a thing of the past. ■

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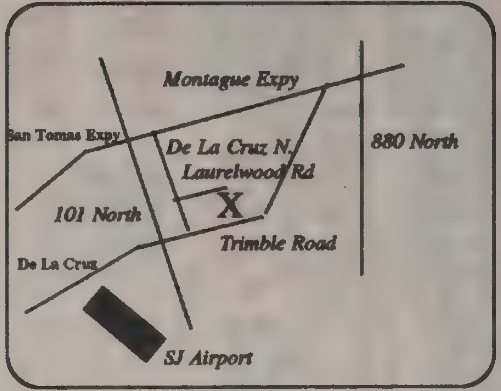

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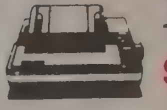

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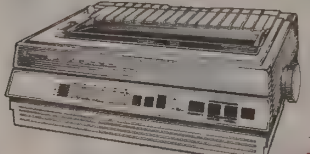

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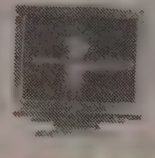

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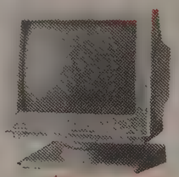

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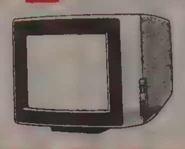

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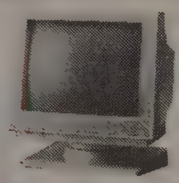

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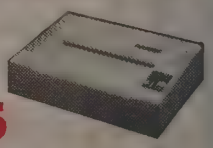

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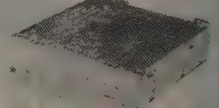

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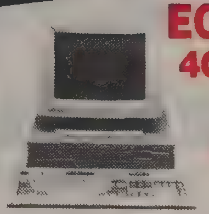

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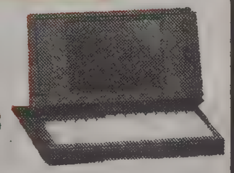

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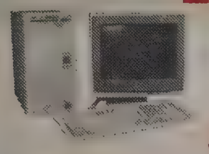

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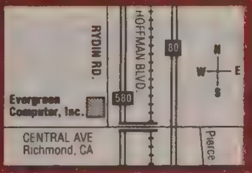

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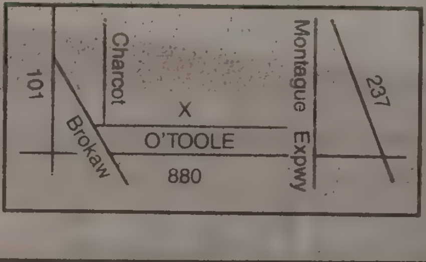

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Where Are The Faires Of Yesteryear?

Plus System 7 Tips

BY DAVID MORGENSTERN

B M U G

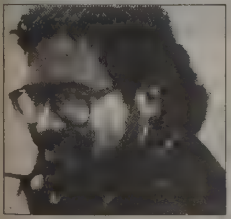
Turn your head and you'll bump into a BMUGer. One might expect a meeting at computer fairs, or prowling around computer flea markets, but at Tibetan craft fairs? The best way to redeem a pathetic baseball game (something that San Francisco fans are enduring in quantity this year) is to talk tech between hits. Batter up!

WEST COAST COMPUTER UNDERWARE

The 16th West Coast Computer Faire (WCCF) crawled out of the silicon muck last month. It seemed much older and lamer than sixteen years—perhaps show years are like dog years. The glory of past golden days, with debuts of ground breaking hardware and software, blew away faster than data in RAM. The name is all that's left of the premier technology showcase of the microcomputer industry.

I couldn't imagine the Faire sinking any lower than last year. There were buxom strippers "demonstrating" computer jewelry, and illegal Nintendo bootleg boards for PCs. But there was a swap-meet energy about the place. A show where you could be assured that at least part of your PC clone was legal, where any deal was possible, and your wallet would not be totally drained of cash (unless it was stolen).

This year the sell-out theme was "the leading show for business computing." Business computing? Come on, who are we trying to kid? Perhaps they're using a very liberal definition of business—like the price of admission. Or perchance a coy, self-mocking parody of real trade shows. Bingo!



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The Faire moved to Moscone Center, barely filling a third of the hall. The hall was divided in two, an "on-floor sellers" side, and a "business" side—the only difference being fewer booths on the biz side of the border. The user group ghetto was on the far end of the sellers section. You know there's trouble with a show when there's no waiting in the coffee line.

Nevertheless, there were a few interesting products:

•Common-Link by Pacific Micro is a $200 utility program that allows PC users to read or copy Macintosh disks. Mac users often find themselves unable to share their data files when they're stuck in a PC-only shop. Common-Link's magic is done entirely in software, without special cables or hardware. Unfortunately, the product only works with high-density 3.5" disks, leaving the more common 800K floppy out in the driveway.

•Kres Engineering had a couple of products of interest to SCSI hackers. The Small Computer Systems Interface is standard on the Macintosh, and allows us to communicate with hard drives, scanners, and other peripherals. The Kres braintrust spoke a different dialect of lingua technoidal than I'm used to, so some of the details may be a bit illogically fuzzy.

There are several flavors of SCSI, excluding the quicker SCSI-2 coming down the bus. The familiar SCSI allows an 18.2' chain, while the differential cable standard can send signals 82 feet away. Devices that use one type of cable cannot usually communicate with the other type. The Kres SDC-100 is a $200 converter that lets them talk to each other.

The company also has hardware that allows SCSI devices to use coax cable, or fiber optics cable, to span distances of hundreds of feet. There are applications in the music industry and in scientific data analysis in which it's desirable to get the noisy hard drive away from the CPU. In the days of the silent fan-less Macs, several BMUGers kept their hard disks in the closet.

Kres Engineering is located in La Cañada (818)957-6322.

•I liked roaming the floor. The Silicon Sports Wrist Pad guys were helping the air quality by fanning their colorful desktop additions. They can be reached at 800-243-

One booth at the Computer Faire was selling an encyclopedic software self-help set, and also instant teeth whitener. I wasn't brave enough to explore the connection.

2972.

One booth was selling an encyclopedic software self-help set, and also instant teeth whitener. I wasn't brave enough to explore the connection.

American Ink Products showed a refill kit for Canon BubbleJet or Apple StyleWriter printers (they're the same inkjet engine), that claims to be permanent. BMUG bought a couple, but we haven't had a chance to try them yet, so join the testing group at your own risk. Call 800-373-0825 to buy the $19 dual refill kit.

There will probably be another Faire next year, and I'm sure it will be a winner. I'm told they keep making enough money to keep going. The increased level of show organizers' kvetching about crowed city streets and downtown parking may indicate a move out of San Francisco. I'll be lucky (depending on one's perspective) to make it through the gate in one piece after this column...

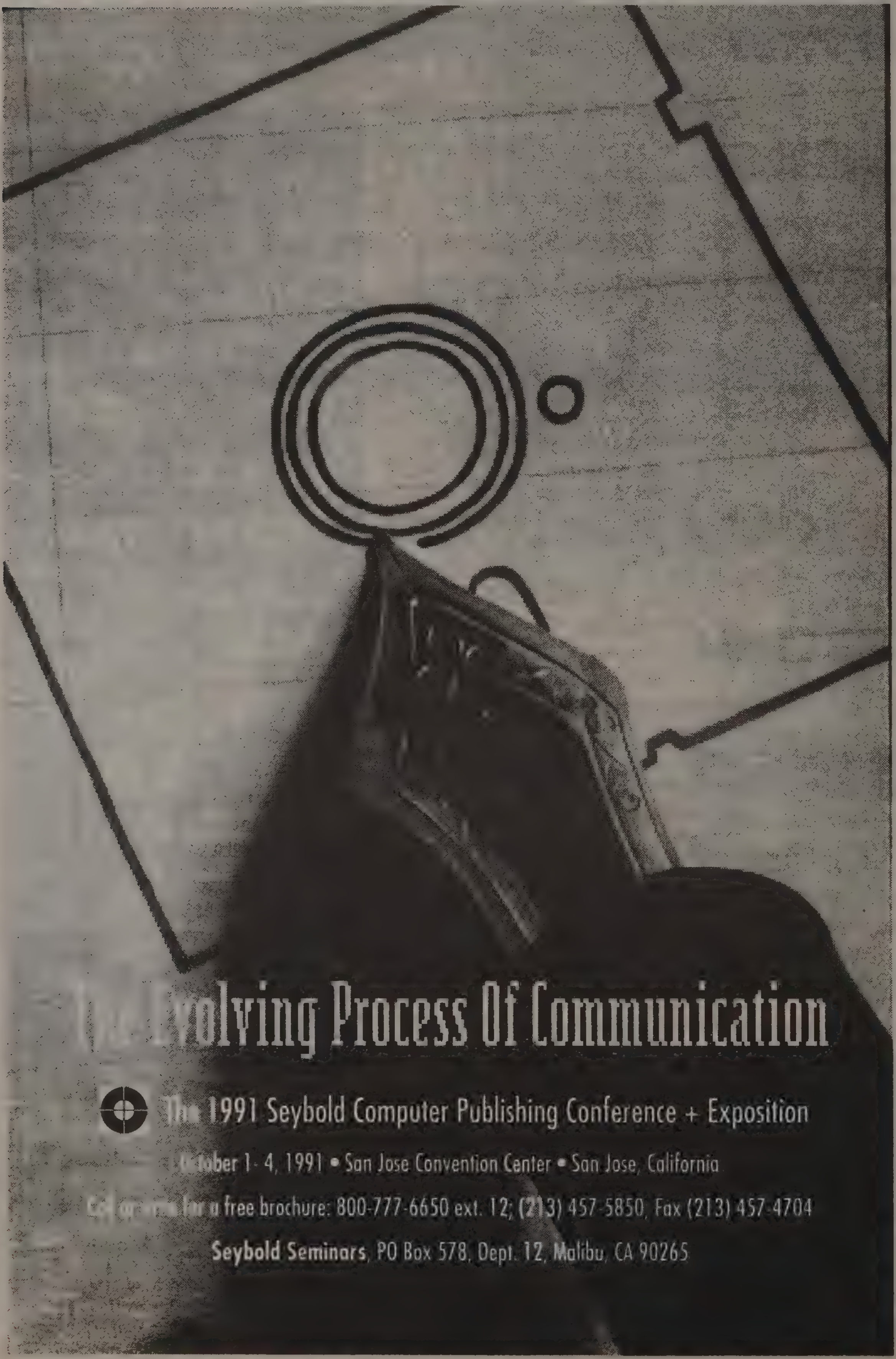
System 7 Revisited

After living with System 7 for a couple of months, I've crystallized my installation methodology (or fixed it in concrete) for users making the transition. If you'll follow my sane and simple plan, you'll be in seven heaven. If not, you'll wind up in a bottomless bit!

Rule One: Pretend that you've never seen a Macintosh before. This is more than just a mental exercise, but an important ritual. Use the latest versions of hard disk utility software, and reformat your drive. Lay down a fresh system on the disk, even though the Installer program could update your old 6.0x system. You're a new user in a brave new Mac-world.

When you start to use System 7, turn off esoteric new features. Users suddenly find their system has swollen by many megabytes without their knowledge. They scream that System 7 is a memory hog, when they're accidentally "using" a feature.

Rule 2: Run a "pure" Apple system for at least a week. The depth of the interface should be used and appreciated. It takes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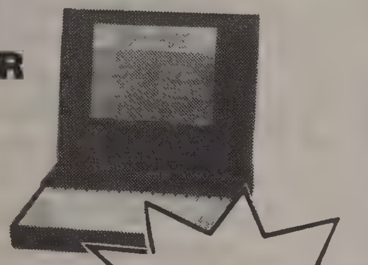

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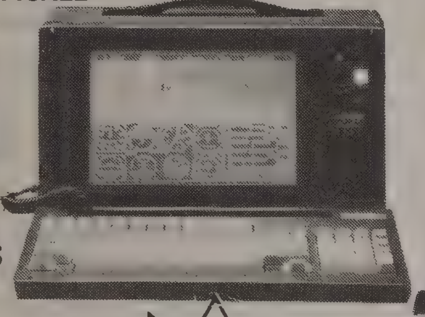

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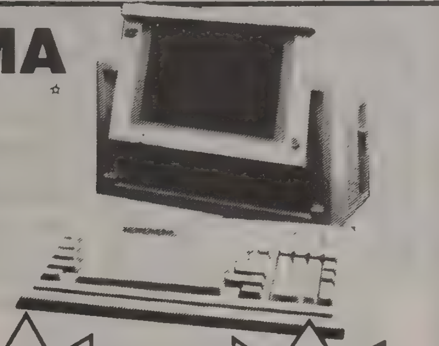

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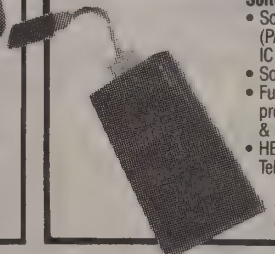

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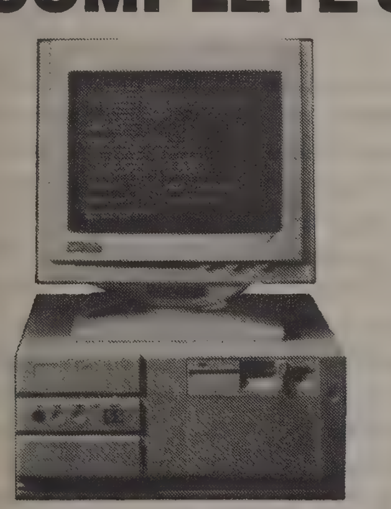

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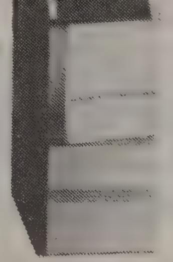

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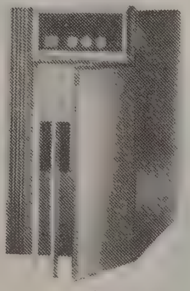

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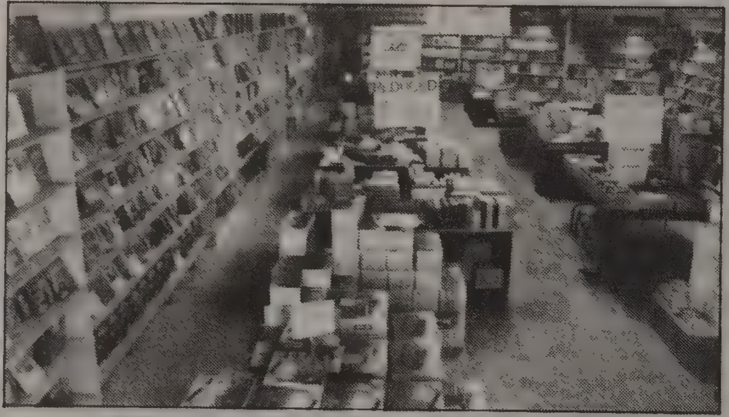

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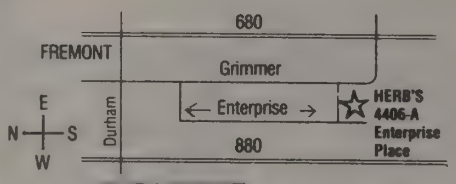

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time to really get the new features integrated into the unconscious.

Finder enhancing software, popular with former power users, should be avoided. I've only added a screen saver (After Dark), and Super Boomerang (in the Now Utilities) so far, and I was a real CDEV/INIT junkie in previous systems. Aliases, especially, can be overlooked in a rush to recreate a previous desktop environment.

Rule 3: Turn off esoteric new features. Don't bother with virtual memory, unless you know what you're doing or have a specific need. The same applies to 32-bit addressing and file sharing. Users suddenly find their system has swollen by many megabytes without their knowledge. They scream that System 7 is a memory hog, when they're accidentally "using" a feature. It does want as much memory as you can throw at it, but piggish? Really!

The Calculate Folder Sizes option in the Views control panel device is a notorious machine slowdown. I don't know if Finder operations are truly slowed, but they appear to be to the subjective eye. Certainly the hard disk has to run around getting the information.

QUIZ KIDS

There are so many new features in the new Macintosh System 7 operating software, new words were invented to describe them. Here's a little System 7 semantics quiz.

What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its ten thousand international members. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semiannual, 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6–9 (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG Office, at 2055 Center Street (a half block from the BART station), is open to the public 9 a.m. to 5 p.m. Please come by and say hello, meet other members, and hang out.

The BMUG HelpLine, (415)540-1742, and our fax number, (415)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 a.m.–5 p.m.). If your question can't be answered on the spot, we try to get you in touch with someone who can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with 650+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ Version II,* our library and more on CD-ROM.

Our BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you are as well as send mail to users everywhere! BMUG is a part of the international USENET network (ucbvax!garnet!bmug) or (user.name.bmug@garnet.berkeley.edu). With our multiline capability you are now able to have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

To get some further information about BMUG please write to: BMUG, 1442A Walnut Street #62, Berkeley, CA 94709. If you prefer to phone our business office call (415)549-BMUG, or FAX (415)849-9026.

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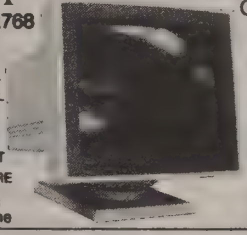

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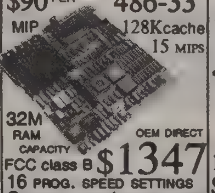

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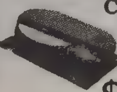

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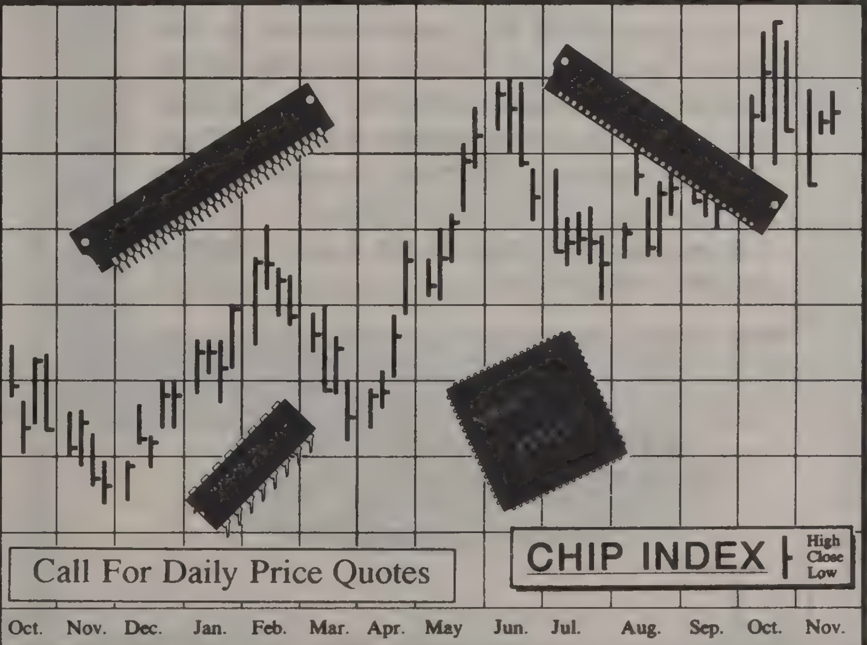

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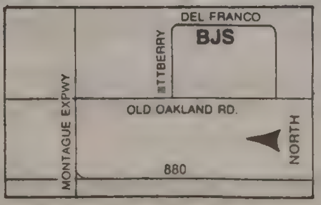

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1) Tunneling is...
a) the action of a computer worm virus.
b) surgery that restores feeling to your fingers after too many late nights playing computer games.
c) the result of holding down the mouse when opening a folder.

2) Persistence is...
a) the secret of getting ahead in marketing.
b) the thing we all hate about people in marketing.
c) what causes icons and window to stay where they're put on the desktop.

3) Adornment is...
a) wearing pearls with your BMUG tie-dyed T-shirt.
b) changing something in a subscribed document.
c) what some hackers call brushing their teeth.

4) Rubberband Select is...
a) the highest grade of rubber, grown in sandy alkaline soil.
b) a musical group featuring instruments made from stationery supplies.
c) the insider's name for Drag-Select.

5) Inter-Application Communication (IAC) will let Macintosh programs become more...
a) modular.
b) safe and sane.
c) swollen and bloated like a tick.

ANSWERS:

1) c—The result of holding down the mouse when opening a folder. This causes the previously opened window to close, when the folder is opened. This helps keep the desktop from becoming window soup. The later iterations of System 6.0x had this feature too.

2) c—What causes icons and window to stay where they're put on the desktop. A very annoying habit of previous systems was the bullheadedness of icons on the desktop. No matter how many times we'd move them to exactly where we'd want them, they'd always return to their default position after rebooting. This was especially annoying on a large screen monitor. The trashcan icon was always miles away from the file and folder action at the top of the screen. Now your Mac lets you put things where you want them, and they'll stay put.

3) b—Changing something in a subscribed document. One of the hot features of System 7 is publish and subscribe, which should logically be plural, but ain't. It allows you to take text or graphics from one application (the publisher), use them in another (the subscriber), while still having active links to the originating document. Changes in the originating document are reflected in the subscription. Published material is called an edition, kept track of by the Edition Manager.

The trail of published and subscribed material doesn't have to be a single step. A chart from a spreadsheet might be brought into a

Continued on page 208

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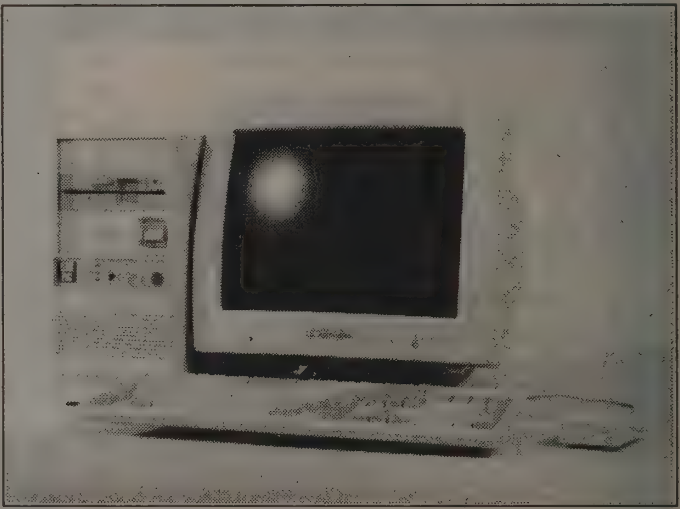

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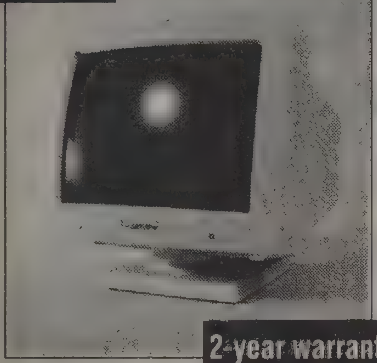

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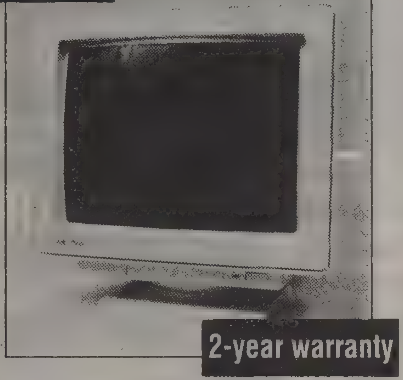

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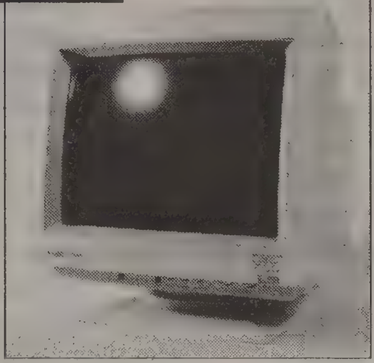

Nanao Flexscan 9080i

Specifications:

- CRT Trio Pitch: 0.28mm (Dot)
- CRT Size" 16: (15V) 90° Deflection
- CRT Face Treatment: Dark Face, Anti-static-electricity coating
- Recommended Resolution: 1024 dots x 768 lines
- Maximum Resolution: 1280 dots x 800 lines
- Scan Frequency: H: 30 - 64 KHz
  V: 50 - 90 KHz

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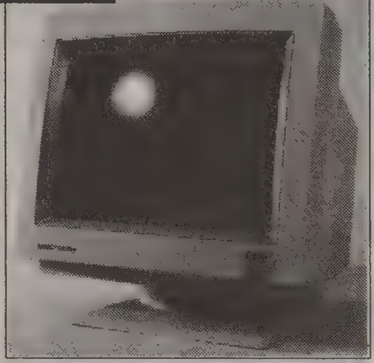

Nanao Flexscan 9070

Specifications:

- CRT Trio Pitch: 0.28mm (Dot)
- CRT Size" 16: (15V) 90° Deflection
- CRT Face Treatment: Dark Face, Anti-static-electricity coating
- Recommended Resolution: 1024 dots x 768 lines
- Maximum Resolution: 1280 dots x 800 lines
- Scan Frequency: H: 20 - 50 KHz
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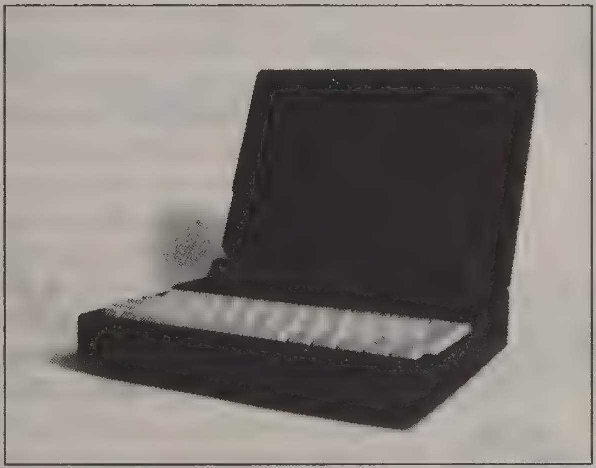

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Professional Drawing With ProVector

New Program Sets The Standard For Amiga Platform

BY MATTHEW LEEDS

AMIGA

The Amiga has been a clear success in several areas, but desktop publishing has not been one of them. While there have been several decent Amiga-based desktop publishing packages, the requisite supporting programs have either fallen short or not existed. Illustrator on the Mac and Corel Draw on MS-DOS machines brought professional, structured drawing power to those machines; this is a necessary component to a complete desktop publishing solution, and the Amiga has had no comparable product.

Now ProVector, a structured drawing program from Stylus, Inc. (formerly Taliesin Inc.), brings the same kind of power to the Amiga. ProVector supports several formats including Encapsulated PostScript (EPS), IFF (including HAM), and its own format D2RD, a new IFF standard. ProVector drawings can be exported directly into PageStream 2.0 and Saxon Publisher, or they can be printed directly to any Preferences printer, to a PostScript printer, or to an HPGL plotter.

> **ProVector is a remarkable accomplishment. If you're looking for a professional drawing program for the Amiga, it sets the standard.**

PROVECTOR CAPABILITIES

Many Amiga programs do not compare well against similar packages on other platforms. This first release of ProVector is an excellent attempt at breaking that stereotype, meeting the challenge well in many areas and falling short in only a few.

The first thing you notice is that the publishers took the time to present a professional package. The manual is contained in a slipcover, and is three-ring bound, which allows it to lie flat and also lets you add more pages as updates arrive. There are both a table of contents and an index, and the technical support number is right up front where you can find it; the hard drive installation instructions and the startup instructions provide support for both Workbench and CLI users. There is a Workbench install program, and a detailed list of all files and their proper location for CLI users.

The package includes three versions of ProVector. The first will run on any Amiga. The second adds support for 68020 and 68030 equipped Amigas, and the third adds support for floating point math (this increases accuracy at the expense of speed). All versions will run under either Kickstart 1.3 or 2.0. No copy protection is used, not even manual-based word lookup. This is as it should be, professional software should never include copy protection. The 020/030 version is very fast, far faster than any other drawing program I've used on the Amiga.

Copyright © 1991. All rights reserved. Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.

Several fonts come with the package, some stroke fonts, others outline fonts. A font conversion utility to convert PageStream fonts into ProVector fonts is also included.

ProVector takes an interesting approach to solving the Amiga's limited color display capabilities. It uses dithering to supply up to 256 colors on-screen from a palette of sixteen million. Any object may be filled with one of these colors. Since most color printers generally use dithering to support more than four colors, this approach should provide good results on most color printers. I did not have a way to test the results of color separating a PostScript file created in ProVector using these dithered colors, and I'm not sure what the results would look like. There was no mention of this in the manual.

In addition to being able to fill an object with a color, you can also fill it with a pattern. ProVector comes with over two dozen patterns, and you can add new ones by drawing your own pattern and copying it to the fill requester. There are thirty-two pattern fill slots in the requester, but no provision for loading and saving additional fill patterns directly.

ProVector may be thought of as having three basic modes: object creation, object manipulation, and object editing. The creation mode involves creating new objects. Most of the standard drawing tools are available: freehand draw, ellipses, boxes, polygons, text, grid snap, magnification, and fill. The manipulation mode offers lasso selection of an object or group of objects, grouping and ungrouping, popping objects front to back and back to front, copying, rotating, scaling, and deleting. The editing mode provides the usual cut, paste, copy, and delete, plus select all, merge and split, and smoothing and unsmoothing. You may also create up to 256 separate layers that may be independently named, locked, hidden, edited, and rearranged.

Text support includes the aforementioned fonts and font converter, selectable point size, typeface and fill, and a very nice text-to-path feature that offers excellent control over the direction the text flows, and whether text is on the inside or outside of a path.

Other features worth mentioning include magnify, unlimited undo (to the limits of memory on your Amiga), excellent online context sensitive help (ProVector actually uses the Help key), the option to close Workbench to gain extra memory, the ability to select

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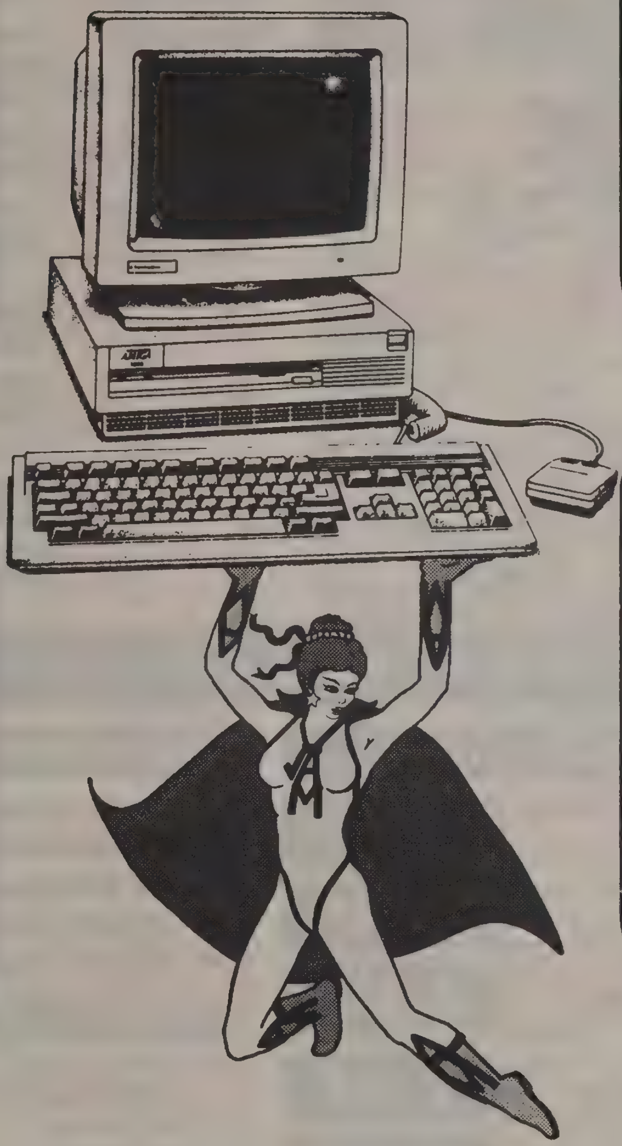

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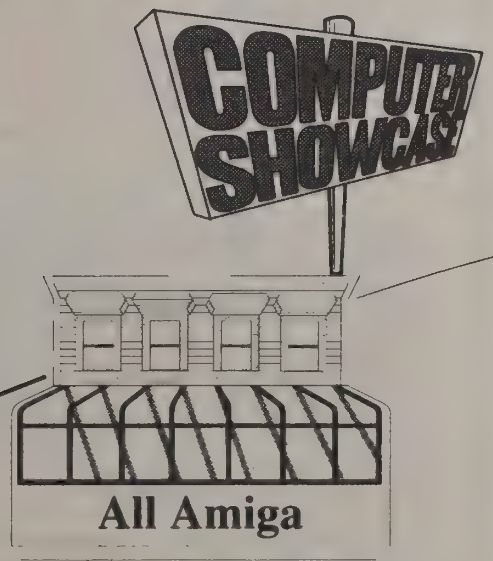
This ad was designed at Computer Showcase on the Amiga using Deluxe Paint III, Pro Page, Pro Draw and lots of imagination.
Artwork for Amiga Mama by Penelope Terry of Terra Linda, Calif. (415)472-1795



The Bay Area Center for the Amiga Arts only a portion of the drawing for output to a printer, and over 125 AREXX commands in the ProVector command set. An excellent reference section on AREXX is included in the manual; every AREXX command for ProVector is listed along with its purpose, syntax, and return codes. This section of the manual sets a standard that other Amiga programs should follow for documenting their AREXX commands.

There are a few rough edges still left in ProVector. You must reselect an object manipulation tool each time you want to use it; they deselect after each use. The online help interface needs a little work. Some of the manipulation functions are not intuitive; I had a hard time remembering how to select a single point in an object. Some tools bring up requesters if you double-click on them; sometimes I had to double-click more than once to get a response.

Even with these small flaws, ProVector is a remarkable accomplishment. The program will run on a 1MB Amiga, and can even be run on a system with a single floppy drive (not that I recommend this practice). It supports IFF bitmap output, lets you select the unit of measurement you want, has keyboard shortcuts for most menu items—the list is far longer than this space allows for. If you are looking for a professional drawing program for the Amiga, ProVector sets the standard. ■

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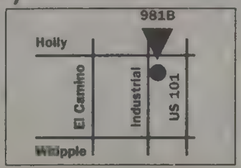

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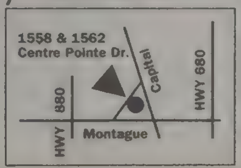

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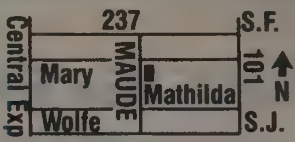

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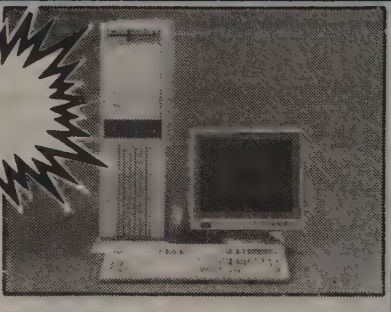

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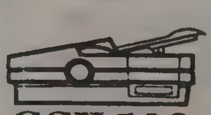

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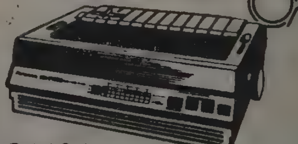

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Continued from page 36

the serial ports on your portable and desktop PCs. You copy files using visual screens. It even comes with cables. This is also handy for transferring files to a client's PC without having to swap floppies.

SIGHT SAVERS

Some companies have embraced the portable market as a special niche, providing great software at a low price. These programs often help overcome one of the most pervasive shortcomings on laptops, namely the difficulty in seeing the screen well.

> **Unlike word processors, most telecommunications programs are small and do not require much disk access. Even the programs with a wealth of features are not too large and can often be run from a single floppy with lots of room to spare.**

Personics recently released the innovative Laptop UltraVision, a program that helps make the laptop screen much easier to read. This program only works on portables with EGA or VGA graphics. Laptop UltraVision comes with better fonts for the screen so that characters stand out more clearly. You can also control the screen colors much more effectively. For VGA systems, Laptop UltraVision will also utilize more of the screen than is normally used by most systems by changing the mode and using taller (and thus easier-to-read) letters. This program takes up almost no disk space and only 8–14K of memory.

Portable screens are notoriously bad in low-light or harsh-light situations, such as motel rooms or airport terminals. SkiSoft produces Eye Relief, a word processing package that makes using portables much easier. Eye Relief is a simple text editor that lets you specify how large the characters appear on the screen, from normal size all the way up to one inch tall. You can also change the color scheme to increase contrast. Even under the worst lighting, you can usually follow what you are doing with the larger characters and better contrast. You can also vary the amount of white space between lines. This is, of course, also a boon to vision-impaired users who can use it on standard PCs.

Since most word processing on the road can be done as plain text editing, Eye Relief can replace a word processor. It has more features than simple text editors, including word wrap, headers, footers, and so on. It takes up only 80K on disk and runs quite quickly, even on the slowest of portables.

MICE

Although you can't run Windows on a floppy-only PC, many programs you might be running on your portable are greatly enhanced by a mouse. Until recently, you had to use a serial mouse, which caused two problems: you had to find a place to carry it, and you had to have enough room to use it. Earlier this year, Microsoft and other manufacturers shipped trackballs specifically designed for portables that are light and easy to use even in cramped quarters. There are now at least five knock-offs of the idea and many more announced.

These portable trackballs attach to the side of your portable's keyboard. You use your thumb or index finger to roll a ball that's in a socket. There is also a button that corresponds to the mouse button for clicking. It takes a bit of getting used to for mouse users, but it sure beats using your pant leg.

MAKING THE BEST OF WHAT YOU'VE GOT

A portable with a hard disk alleviates all of the problems described in this article, but it is often impossible to upgrade a floppy-only portable with a hard disk. Don't get rid of your old portable; a bit of creativity should get years of use from it if you're willing to do a bit of research and use software and hardware that you don't use in the office.■

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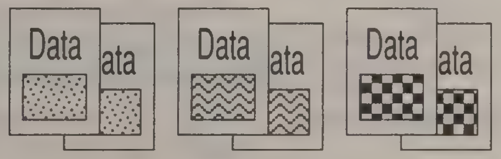

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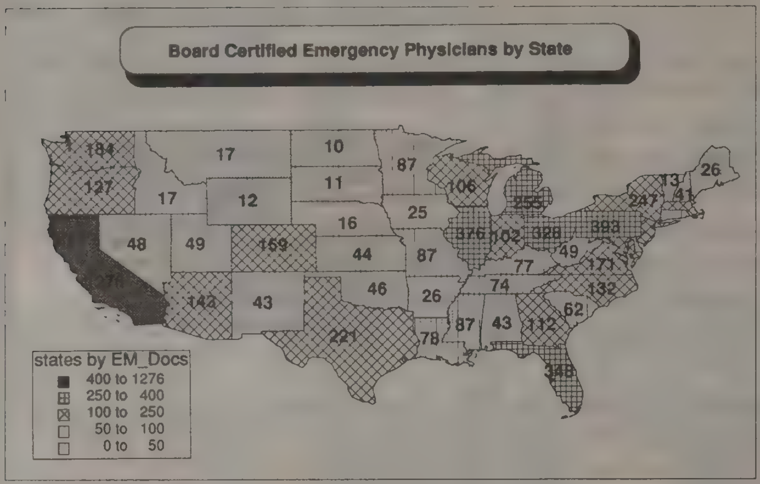


EmCare uses MapInfo to display the number of emergency care physicians state by state on a map.

map, edit information in MapInfo, or relocate a point. MapInfo gives you a wide range of viewing options, such as the whole world, individual continents, particular blocks, or buildings.

Like traditional maps, MapInfo can display many different boundaries simultaneously on the map with any color, shading pattern, or line design. Its drawing tools allow you to interactively draw, modify, and merge boundaries. Textual information about boundaries, such as demographics or history, can be stored on database files directly in MapInfo or in compatible database formats.

Layering is a way of handling complex information. You can put different kinds of information on different layers in a map and illuminate trends and patterns by displaying the different layers.

With the geographic information linked to a text database, you can use text information to locate any point or boundary on a map. This capability has been very important for emergency services. When someone makes an emergency call, for example, the operator can locate them on a map within seconds just by typing in the appropriate command, and can dispatch help immediately.

Once you have completed matching the data and map, and finished a geographical or text search, or both, MapInfo lets you save the results in any convenient file format and to send the output to a wide variety of printers and plotters. You can also place MapInfo images into other programs, such as desktop publishing or word processing.

MAPINFO HELPS MEET THE EMERGENCY IN HEALTH CARE

In today's growing health care market, providing the best emergency services is no easy task. Emergency care departments not only play a vital role in the quality of services that hospitals can offer, but make an important contribution to its financial well-being. With over fifty-six hundred acute-care hospitals throughout the United States and more than seven thousand certified emergency physicians, hospitals are increasingly looking to contract management groups to help ensure that they provide the best services possible. EmCare is one of twenty to thirty national health care contract management companies working with hospitals to find and retain qualified emergency physicians.

EmCare contracts with hospitals to offer recruiting, placement, and scheduling exclusively for emergency care physicians. It also provides administrative services to the hospital in quality assurance, market research analysis, strategic planning, and risk management. EmCare targets moderate- and high-volume emergency departments that see at least fifteen thousand patients a year. It currently has forty-six contracts nationally, and a 96% contract renewal record since its beginnings in 1972.

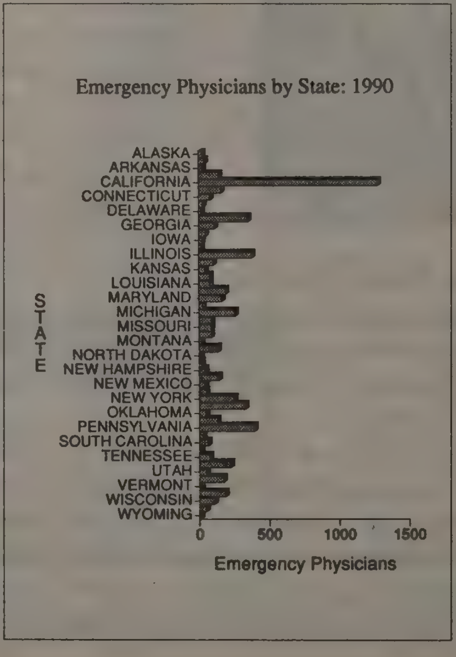
Like emergency patients in the hospitals, clients typically contact EmCare after there is a problem. This means EmCare has to be "top-of-mind when the crisis comes," according to Robert Briscoe, EmCare vice president of marketing/business development. "There is usually some sort of problem happening at the hospital, either a physician is leaving or passed away or retired, or the group left to take another contract elsewhere. They come seeking us, saying 'we need to do this.'

"There is a very competitive process. You make a conceptual presentation to try to compete. Once you get to compete you do a full-fledged proposal. The more specific or technical you can make that proposal, obviously, the better able you are to compete.

When Robert Briscoe joined EmCare in December 1990, everything was done from the Sequent S27 server with about seventy X-terminals. There was talk of wanting to do more sophisticated marketing research as well as in-house art development and desktop publishing. To achieve these goals, they started shopping for a workstation that fit into the existing UNIX environment and offered the appropriate software. After doing their homework and visiting the UniForum UNIX trade show in Dallas, they decided to add a SPARCstation 2 in early 1991.

After getting the SPARCstation, Briscoe started adding software. "I've used some mapping software, such as Macintosh-based GeoQuery," said Briscoe. "But I use some very large databases. The American Hospital Association gives me an awful lot of information about every hospital in the United States: seven thousand records and up to about one hundred fields in each record. I also work with geographic data, zip code demographics such as age groups and income groups, and other forms of data—all of this coming together to create these maps. I needed the power of the Sun and the database handling capability of a MapInfo in order to do all of this. In addition to such databases as the one from the American Hospital Association, in a tab delimited ASCII format, EmCare's own Progress database on the Sequent has roughly three hundred thousand records.

"The mapping itself is a very interesting presentation technique. But MapInfo is of a level above what else is out there in terms of handling the databases, not only within one database but among each other, creating relations." Recently Briscoe was working with a map of the entire United States, analyzing emergency department visits in each state and color coding the result into four or five categories. This meant working with two databases together. EmCare's own records were already organized by state and just needed another field to add a code number for each state to link it to the database from the American Hospital Association. The American Hospital Association, however, lists every hospital for every state. First, MapInfo had to tabulate the visits for the individual hospitals to come up with one number for each state and then link the two sets of data together for analysis. MapInfo let Briscoe easily analyze the



MapInfo allows you to view the same information on charts as well as maps.

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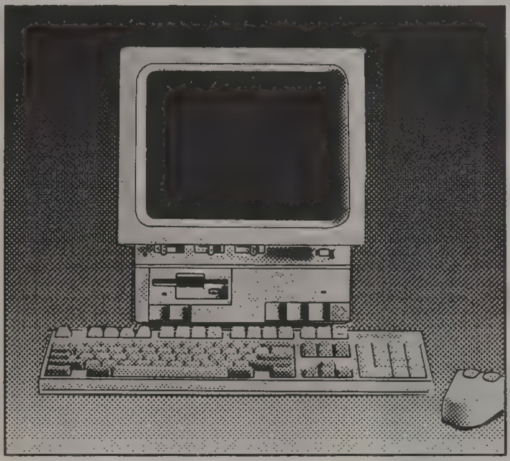

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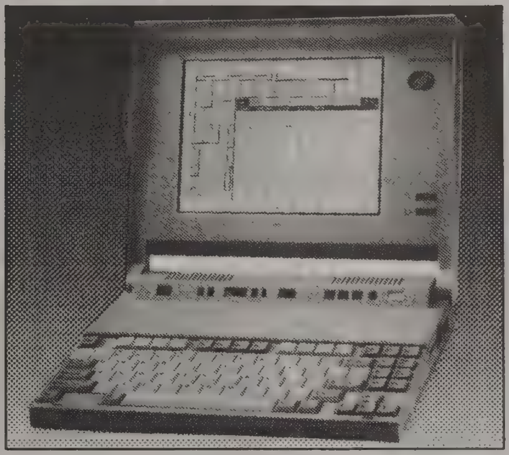

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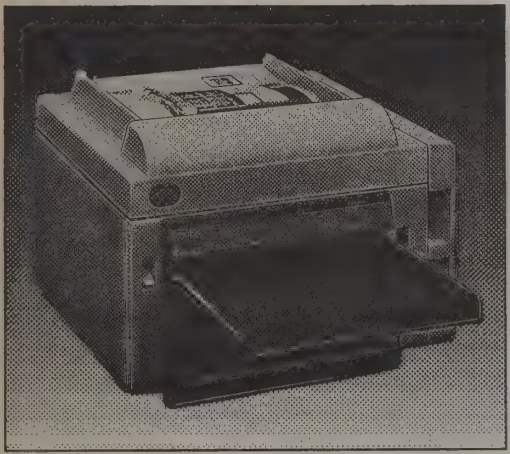

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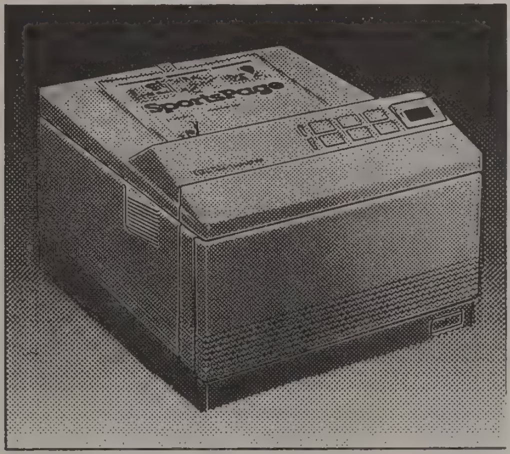

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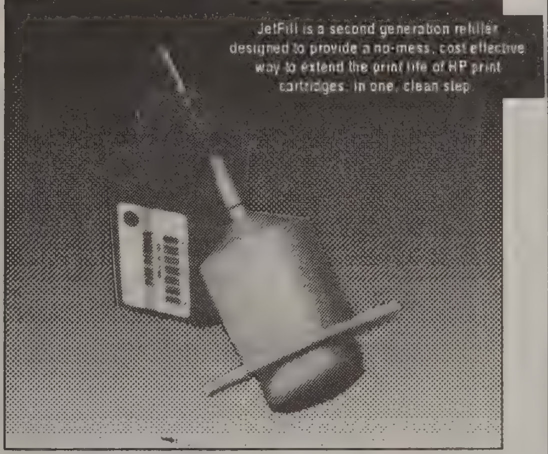

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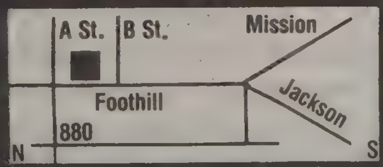

BUSINESS SOLUTIONS

more than seven thousand records with the push of a button.

MapInfo does more than make Robert Briscoe's work easier by letting him do quicker analysis. It lets him provide more and better information to his clients. "A big part of what I do with the MapInfo system is marketing consultative selling—showing people some of the things we can do in their marketplace," said Briscoe.

The most effective GIS applications allow users to layer different combinations of data from multiple sources into a single map, summarizing its geographic, cultural, scientific, and other attributes.

"When we go for these new contracts, we have to do a proposal. In doing the proposal we never had that much specific information before to give them. I am actually going to do a market study for them that shows them where their patients or customers are coming from and show the demographics of other zip codes around their hospital, show them where some desirable people might be, that they might want to have come to their emergency room if they need that. And help them do some direct mail. As part of my document I think that will be pretty impressive in comparison to what the other competitors will have, which is basically verbiage that we can do this sometime in the future, this is just words that promise something. I'm going to actually have the product. I think that is going to set me apart from my competitors."

MAPPING THE WORLD

Everyone at EmCare believes the UNIX operating system is where the action will be in the future, and they see the Sun SPARCstation as their preferred system. While preparing new business proposals, conducting market analysis research, or simply tracking possible recruits for emergency care departments, EmCare has joined the strength of the Sun SPARCstation with the depth offered by MapInfo.

But you don't need a SPARCstation or three hundred thousand record databases to benefit from MapInfo. And as Robert Briscoe points out, while MapInfo's mapping capabilities are important for data visualization and presentation, it is the database handling capabilities that separate it from its competition.

Since its invention, maps have helped us to better understand information about our world. The current generation of Geographical Information Systems is combining mapping capabilities with data analysis and bringing everything to the desktop. The ability to easily manipulate data from different sources and present it geographically strengthens visual presentations as well as the information that supports your maps. ■

CREATIVE TOOLS

Continued from page 194

drawing program to be prettied-up, before it lands in a page layout program. The additions to an edition are called adornments.

A BMUG tie-dye T-shirt is always in style, no matter what the occasion! They go with anything—pearls, jeans, or at the beach. One of the Apple System engineers, when showing the Labels feature of System 7 at the BMUG main meeting, asked what was the official BMUG color. The answer? Tie-dye. Call the BMUG office to order a shirt.

4) c—The insider's name for Drag-Select. Dragging the mouse and selecting icons used to be something that could only be done in the icon, or small icon views. You can now drag a rubberband around the little icons of files shown in all the various list views (Name, Size, Kind, Date, Label, Version, or Comments).

There's another helpful addition to the drag-select operation. As you drag the rubberband, the selected files will highlight as they're enclosed. Previous systems would highlight selections after the mouse button was released, and there was always a stray file that was missed.

UPCOMING EVENTS:

July 11	Farallon New Products.
July 18	MacroMind MediaMaker, Mass Microsystems Video Products.
July 25	Animatrix Interactive Animation, NeXT Color Machines.
July 29	BMUG West at the San Francisco Exploratorium museum. Alysis SuperDisk!
August 1	Kohtec Toolkit (HyperCard), Brøderbund Kid Pix and Letterhead.
August 8	IOMEGA Bernoulli Box drive
August 15	Sitka New Product, SuperMac PixelPaint Professional.

• Your Expanding Infosphere radio show, Saturdays at noon, KALW-FM 91.7, has BMUG meeting announcements. Check it out!

5) a—Modular. Since programs will be able to talk to each other, their engineers won't have put everything under the sun into their software. They may rely on other applications to provide extra features, rather than spending valuable programming time to write everything from scratch.

ThoughtPattern, a personal information manager from Bananafish Software, has a complex set of alarm functions built into the program, but they only work when the program is up and running. Instead of having to write a separate Extension or Control Panel Device to make sure users get their alarm notifications, ThoughtPattern's designer said they may use IAC to piggyback on existing alarm clock software.

SHAREWARE SPOTLIGHT

System 7 incorporates the TrueType outline font technology. It's the same general idea as Adobe Type Manager (ATM) is to PostScript Type One fonts, but it's free. The system upgrade comes with many familiar Macintosh fonts, including Chicago, Monaco, and Geneva, but few fancy display typefaces.

BMUG has a special five-disk set of TrueType fonts, with over twenty-five different faces. Some are sans serif classics like Premium or Granite Sansz, while others, Mazama and Konanur Caps, are in a wild, Art Nouveau style. There are dingbats, and even Saint Francis, an outline version of the crazy San Francisco font that came with the 128K Macintosh.

The TrueType set is available from the BMUG office for $12. ■

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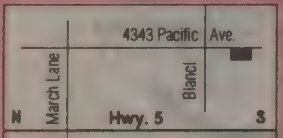

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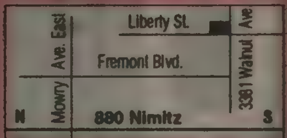

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The HP LaserJet III Family's Newest Member.

HP LaserJet IIIP Printer

NEW

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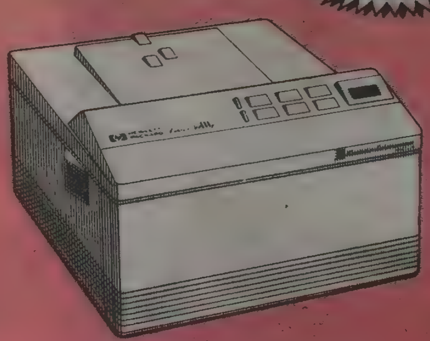
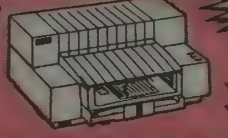


End User Target:
- Superior 300-dpi print quality
- PCL5 allows you to scale type to thousands of sizes
- All the HP LaserJet III printer features in a compact size and at a low price
- Prints fonts, graphics and complex documents faster than other laser printers in its class
- Versatile paper handling capabilities
- PostScript® options for PC or Macintosh

Call or come in for Demo.

HP DeskWriter Printer

HEWLETT PACKARD *Authorized Dealer*



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▼ For Macintosh®. Fits on your desk.

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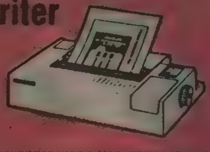
Film and Paper
200 CPS NLQ
180 x 180 DPI
Portrait or
Landscape Print Modes
Parallel or Serial



$599*

* After $200 rebate from HP.

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- Wide variety of built-in fonts
- 3-year warranty
- Quiet, desktop operation

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HP IIP Only $799

To earn the Okidata OK, we had to re-invent the laser printer

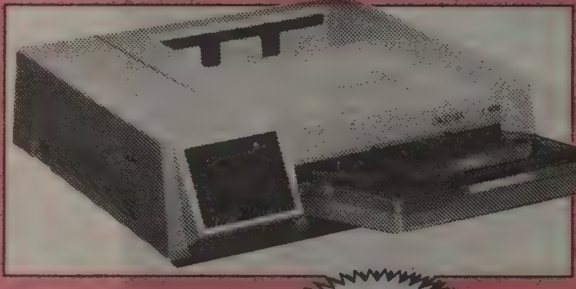
At $599, the Okidata OL400 is the lowest-priced page printer on the market today. What's more, that price includes features you won't find on any LaserJet.

The 4 ppm OL400 emulates HP® Series II for compatibility with most popular software, and comes complete with more standard type faces and more resident fonts, plus a high-capacity paper tray that's optional on the HP-all in a slim, lower-profile design that's less bulky on a desktop.

The Laserless Printhead: Warranteed For 5 Years.

The OL400 also comes with the longest warranty in the industry: 5 years on the printhead, plus 1 year parts and labor on the entire printer. To deliver a warranty that strong, our engineers had to re-invent the laser printer.

To replace the conventional page-printer technology of laser beams, lenses and rotating mirrors, they designed a proprietary, solid-state LED printhead with no moving parts.



And the price: $599

Its All In Our Head.

Besides being inherently reliable, the simpler design of the Okidata printhead also means a straight-line paper path that's less likely to jam—even when feeding envelopes, heavy stock, or labels. And, since we build it ourselves, the cost stays low.

The Okidata OK-A Badge Of Honor

The performance and features of the OL400 were good enough to earn it a PC Magazine Editors' Choice Award. But it also had to earn something else — the Okidata OK.

What's the Okidata OK? Simply our promise that every printer we make will deliver not merely acceptable performance, but out-standing performance — not just good value, but exceptional value.

OKI OK!

OKIDATA OK!

We don't design it to work. We design it to work wonders.

EPSON®

NB3 Notebook	Please Call
EPL-7000	$795

EPSON

Epson LX-810	179
Epson LQ-510	279
Epson LQ-850	449
Epson LQ-860	564
Epson LQ-1010	394
Epson LQ-1050	634
Epson FX-850	309
Epson FX-1050	419
Epson EPL-7000 Laserprinter	795

OKIDATA

Okidata ML 320	299
Okidata ML 321	429
Okidata ML 380	280
Okidata ML 390 Plus	434
Okidata ML 391 Plus	589
OkiLaser 400	599

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TOSHIBA

Toshiba T1000SE	CALL
Toshiba 1000XE	CALL
Toshiba T3100SX 40 MB HD	CALL
Toshiba T3100SX 80 MB HD	CALL
Toshiba T3200SX 40 MB HD	CALL
Toshiba T5200 40 MB HD	CALL
Toshiba T5200 100 MB HD	CALL
Toshiba T1200XE	CALL

CLEARANCE SECTION *Limited Time Offer*

Intel inboard AT	$299	Mouse pad	3
Intel above board	99	Epson LQ multifont	10
IBM AT stand	49	Epson 386-20 MHz 2 MB	995
VGA monitor 640x480	249	HP III toner cartridge	89
Epson LT 386SX/40	1995	HP Great Start font cartridge For HP DeskJet + TimesRoman font	29
HP IIP/III memory board 0MB	49	Hayes 2400B	189
HP IID envelope feeder	199	Nec P9300	349
Epson tractor feed/CSF	40% OFF		

TOSHIBA

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T1200XE-40

$1999

- 12 MHz 80C286 Processor
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- Lightweight (7.9 lbs.)

RESOURCES

Calendar Of Events

JULY

July 9–10 MacroMind Train The Trainer Multimedia Class. San Francisco. MacroMind. Call: Developer/Trainer Services, (415)442-0200.

July 9–12 Basic AutoCAD, Level I Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

July 10 Using Technology To Shape Our Sense Of Community: A Discussion With Evelyn Pine, Director Community Memory Project. Berkeley. CPSR. Call: (415)652-8362.

July 10–31 An Intro To Microcomputers Using The Personal Computer Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

July 11–12 MacroMind's Interactive Multimedia Seminar. San Francisco. MacroMind. Call: (415)442-0200.

July 12 NetWare v2.2 System Manager For Consultants And Technicians Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

July 13 Computer Show & Sale. Pleasanton. MarketPro. Call: (415)388-8893.

July 13 Computer Show & Sale. San Mateo County Expo Center. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

AUGUST 14–16

SECOND ANNUAL MACINTOSH SUMMIT CONFERENCE

University of California, Santa Barbara

This conference is for experienced and high-end Macintosh users who want to learn how to be more productive and creative with their Macintosh. Guy Kawasaki, author, columnist, and former director of software product management at Apple will host the Conference. Topics include: Digital Imaging Magic, Desktop Publishing, Design Principles for Non-Designers, Networking and Communications, Database Publishing Frontiers, Object-Oriented Drawing, and HyperCard 2.0. Contact: SEM Dept., UCSB Extension, Santa Barbara, CA 93106-1110. (805)893-4143 or 893-4952. America Online: Mac Summit.

July 13 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 14 Computer Show & Sale. Sacramento. MarketPro. Call: (415)388-8893.

July 15 MORE: Outlining And Presentation For The Macintosh Training. San Francisco. Symantec Training Group. Call: (415)898-1919.

July 15 MS DOS For CAD, Level II Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

July 15 Windows Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

June 15 & 22 HyperCard Scripting Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

July 16 Real Estate Management With Platinum Series Software Seminar. San Jose. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

July 16 & 23 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

July 17 Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

July 18 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

July 18 Adobe Illustrator For Beginners Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

July 19 Troubleshooting A Novell Network Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

July 20 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 20 Computer Show & Sale. Cow Palace. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

July 21 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

July 21 Computer Show & Sale. Concord. MarketPro. Call: (415)388-8893.

MACSCITECH CONFERENCE ON SCIENTIFIC & ENGINEERING APPLICATIONS FOR THE MACINTOSH CALL FOR CONFERENCE PAPERS

The Macintosh Scientific and Technical Users Association (MacSciTech) has announced the First Annual Conference on Scientific Engineering Applications for the Macintosh (SEAM '92). Overlapping one day with MacWorld Expo, SEAM '92 will be held January 15–17 in San Francisco. The technical conference will provide a central forum for discussions on the use of Macintosh computers in all fields of science and engineering, including chemistry, biology, environmental sciences, behavioral sciences, computer aided design, and computer aided engineering. Original paper and poster presentations are currently being solicited for SEAM '92. Deadline for submissions of presentation titles is August 1, and for abstracts October 1. MacSciTech, 49 Midgley Ln., Worcester, MA 01604. (508)755-5242. AppleLink: cons.lab.mfg.

July 22–25 Microelectronic System Education Conference & Expo. San Jose. Conference Management Services. Call: (415)329-0510.

July 23 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

Continued

Calendar Of Events continued

July 23–25 Mactivity '91: The Macintosh Connectivity Conference. Santa Clara. Winehouse Computer Co. Call: (408)354-2500.

July 25 Quark Xpress I Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

JULY 10

THE COMMUNITY MEMORY PROJECT: USING TECHNOLOGY TO SHAPE OUR SENSE OF COMMUNITY

U.C. Berkeley

How can technology be used to increase public access to information and encourage resource exchange? Director Evelyn Pine will describe Berkeley's Community Memory Project, their experiences, and how they've used computers to shape a sense of community. Sponsored by Computer Professionals for Social Responsibility, at 7:30pm in Room 608-7 Evans Hall, U.C. Berkeley. For more information, contact: Judy Stern, (415)652-8362.

July 25–26 Q&A 4.0: Database/Word Processing Software Training. San Francisco. Symantec Training Group. Call: (415)898-1919.

July 27 Computer Show & Sale. Vallejo. MarketPro. Call: (415)388-8893.

July 27 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

July 28 Computer Show & Sale. Hayward. MarketPro. Call: (415)388-8893.

July 29–31 Imaging Solutions For Business Conference. San Francisco. Digital Consulting, Inc. Call: (508)470-3880. Priority code: 1LTAXX.

July 29–August 1 Novell System Supervisor's Training. Emeryville. Northwest Computer Systems. Call: Beth, (415)658-0808.

July 30 MacDraw: Basics And Beyond Seminar. San Francisco. Abacus Training. Call: (415)759-9508.

July 31 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

July 31 Using Lotus Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

AUGUST

August 1 WordPerfect Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 2 Intermediate Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 3 How To Build Your CAD System Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

Continued

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Sun. July 7 - SO. SAN FRANCISCO
Grosvenor Inn
Sat. July 13 - PLEASANTON
Holiday Inn
Sun. July 14 - SACRAMENTO
Scottish Rite Temple
Sun. July 21- CONCORD
Centennial Hall
Sat. July 27 - VALLEJO
Solano County Fairgrounds
Sun. July 28 - HAYWARD
Centennial Hall

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LASER PRINTERS MEMORY

HP II & IID; CANON LBP-8IIR; OLIVETTI PG 108 & PG 208	
1MB Board	$ 98
2MB Board	143
4MB Board	237
HP IIP; III; IIID 1MB Board	97
2MB Board	148
4MB Board	213
IBM 4019 & 4019e	
1039136 1MB Board	$127
1039137 2MB Board	198
1038675 3.5MB Board	343
TI Microlaser & Microlaser PS	
1MB Module	$ 83
Panasonic KX-P4420; KX-P44501	
1MB Board	$137
2MB Board	187
3MB Board	237
4MB Board	287
Epson EPL-6000; Toshiba Pagel Laser 6; Packard Bell PP9500; Facit P6060; Mannesmann Tally 905; AT&T 593 Laser; NCR 6435 Laser	
1MB Board	$ 139
2MB Board	189
4MB Board	289

COMPAQ MEMORY

DeskPro 386/20e; 20; 25e; 286e		
113131-001	1MB Module	$ 102
113132-001	1MB Module	308
DeskPro 386/20e; 25e		
113644-001	1-9MB Exp Brd	223
113645-001	4-12MB Exp Brd	527
DeskPro 386s-16		
113646-001	1MB Module	103
112534-001	4MB Module	308
113633-001	1-9MB Exp Brd	222
113634-001	4-12MB Exp Brd	527
DeskPro 286N; 386N; 386SX/20		
118688-001	1MB Module	123
118690-001	4MB Module	573
DeskPro 386N; 386SX/20		
118689-001	2MB Module	223
DeskPro 286N; 386N		
118700-001	0-4MB Exp Brd	113
DeskPro 386/33		
115144-001	2MB Module	213
DeskPro 386/33L; 486/25; 486/33L; SystemPro		
115144-001	2MB Module	213
116561-001	8MB Module	898
116568-001	32MB Module	5998

APPLE MACINTOSH MEMORY

Mac SE; SE/30; II; IIcx; Ibc; IIcl; IIsl	
1MB Memory Kit	$ 87
4MB Memory Kit	198
Mac IIsi	
M05143LL-A 8MB Kit	698
Mac IIci; IIsi	
16MB Memory Kit	1097
(IIci requires MAXIMA)	
Mac IIfx	
M0376LL-A 4MB Kit	357
16MB Kit (requires MAXIMA)	1397
Mac Classic	
M3631LL-A 1MB Exp Brd	127
3MB Exp Brd	397
Mac Portable	
1MB Card (True Static)	259
2MB Card (True Static)	627
3MB Card (True Static)	827
4MB card (True Static)	1397

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486-33
386-33
TEMPO 386
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386-16SX notebook
386-20SX notebook

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386-33 ACP / BCP	1125/1045
386-25/ no cache	985/815
386SX-20	625

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386-25	895
386-20SX / 16SX	695/645
286-16 / 12	495/445

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1.2 Teac Drive
AT Power
AT Case
101 Keyboard

386-16SX	565
286-16	435
286-12	415

CENTRAL SYSTEM
w/ intel® motherboard
1MB, IDE Adapter
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AT Case, 101 KB

486-33	call
386-33	call
386-25 64K cache	1255

1. 8087 , 80287 , 80387

CYRIX	
80287 - 7/8/10/12/16/20	$89
83D87 - SX16/SX20/SX25	135/145/155
83D87 - 16/20/25/33	199/199/199/209
INTEL	
8087 - 8	70
80287XL	99
80387 - SX16/DX20	149/159
80387 - 20/25/33	229/229/239

2. 1 Meg , 256K , 64K

DRAM	
1 Meg x 1 - 8	$4.90
256K - 8/10/12/15	1.45/1.40/1.40/1.40
256K x 4 - 8	5.10
64K - 10/12/15	1.45
64K x 4 -10	2.50
SIMM	
4 Meg x 9 - 8	199
1 Meg x 9 - 7/8/10	50/48/48
256K x 9 - 8	15
SIPP	
1 Meg x 9 - 8/10	50
256K x 9 - 8/10	16
MEMORY for Apple, AST, AT&T, Compaq, Dec, Dell, Epson Everex, HP, IBM, Nec, Sun, Zenith	call

3. ADD - ON CARDS

DTK	
Monographic w/ Printer	$32
640K RAM Card (XT only)	29
Hexa I/O (XT : SP,G,Clock,Cont)	40
Penta I/O (XT : SP,G,Clock)	33
AT I/O (SP,G)	32
Mini AT I/O (S,P)	29
AT I/O w/ IDE Controller	59
Serial Card (XT only)	17
Printer Card (XT, AT)	17
Game Card (XT, AT)	17
EVEREX	
Magic AT I/O	49
Magic AT I/O w/ Game port	57
MEMORY for Mac,Compaq & others	call

VGA card . . see section #25

4. BOOKS

All New Books 15% off
Microsoft Press
Osborne MacGraw-Hill Press
Peachpit Press (Desktop Publishing)

5. C D ROM

SONY	
CDU 531-11 500MB w/ Controller Card	459

6. CASES

XT Case	$30
Baby AT w/ 200W Power	105
AT Case	50
Baby Tower w/ 200W Power	115
Mid Baby Tower w/ 200W Power	135
Tower AT w/ 230W Power	165
Hard Disk Drive External Casing	
65W	69
2 half ht or 1 full ht, 60W, 11lbs	119
3 half ht or 2 full ht, 60W, space for additional power, 13lbs	139

7. CONTROLLERS

4 Floppies controller	$40
4 Floppies w/ IDE controller	49
ADAPTEC	
2322D 1:1 ESDI w/ kit	195
1542B SCSI w/ kit	299
DTC	
6280 1:1 ESDI	135
7280 1:1 MFM	70
7287 1:1 RLL	79
DTK	
Floppy Controller (XT)	18
Controller 1.2 & 1.44 (XT, AT)	35
IDE Controller DTK/Non-DTK	35/30
IDE w/ AT I/O (2 SP,G)	59
FUTURE DOMAIN SCSI Controller	
TMC 850 for XT (H only)	79/139 kit
TMC 875 for XT (F & H)	129/209 kit
TMC 860 for AT (H only)	119/139 DOS/259 kit
TMC 885 for AT (F & H)	139/169 DOS/259 kit
TMC 1660 for AT (H only)	159/199 DOS/289 kit
TMC 1680 for AT (F & H)	189/239 DOS/309 kit
ULTRASTOR	
ULT 12F/32 32K ESDI cache	185
ULT 12C/1 1MB ESDI cache	565
WESTERN DIGITAL	
Gen Card (XT)	55
1003V 2:1 MFM	85
1007 SE2 ESDI	155

8. DIGITIZERS

Calcomp 23120 12"x12" 4 button & pen	289
Seiko DT3613 12"x12" 4 button & pen	289
SummaSketch II 12"x12" 4 button & pen	325

9. DRIVES

TEAC	
360K 5.25"	$60
720K 3.5" w/ frame	62
1.2MB 5.25"	65
1.44MB 3.5" w/ frame	65
CONNER (IDE)	
CP-3000 40MB 25ms 3.5"	199
CP-3044 40MB 25ms 3.5"	219
CP-3104 100MB 25ms 3.5"	359
CP-30104 120MB 25ms 3.5"	389
CP-3204 200MB 16ms 3.5"	615
MAXTOR	
4170-170 167MB 14ms ESDI 5.25" full	799
4380-380 338MB 16ms ESDI 5.25" full	1105
4380S-380 338MB 16ms SCSI 5.25" full	1115
8760-760 676MB 16ms ESDI 5.25" full	1630
8760S-760 676MB 16ms SCSI 5.25" full	1720
LXT 213SY 200MB 15ms SCSI 3.5"	695
LXT 213A 213MB 15ms IDE 3.5"	625
MICROSCIENCE	
HH1090 80MB 25ms MFM 5.25" half ht	325
NEC	
D3142 40MB 28ms MFM 3.5"	265
D5655 150MB 18ms ESDI 5.25" half ht	599
PLUS DEVELOPMENT	
Hardcard II 80 80MB, 19ms	499
Hardcard II XL 50 50MB, 9ms	389
Hardcard II XL 105 105MB, 9ms	585
SEAGATE	
ST-225 20MB 65ms MFM 5.25" half ht	190
ST-251-1 40MB,28ms,MFM,5.25",1/2 ht,kit	245
ST-157A 40MB 28ms IDE 3.5"	189
ST-1102A 80MB 19ms IDE 3.5"	305
ST-1162A 143MB IDE 3.5"	450
ST-1239A 211MB 15ms IDE 3.5"	615
ST-277N 64MB 28ms SCSI 5.25" half ht	315
ST-296N 84MB 28ms SCSI 5.25" half ht	335
SYSGEN	
Easy Floppy for all AT 720K/1.44MB	90

10. EXTERNAL DRIVES

DELTAIC	
SuperBaby w/ power & carrying case, 2.25lb	
40MB, 25ms	555
117MB, 19ms	785
SYSGEN	
Portable EasyFloppy 3.5" for laptop	235
Portable EasyFloppy 5.25" for laptop	235

11. KEYBOARDS

NORTHGATE OMNI	
101NI / 102	$69/74
Ultra	95
Keyboard cover for 101 / 102 / Plus / Ultra	15
OTHERS	
KEYTRONIC 101	45
MAXI 101	40
MITSUMI 101	40
101 Keyboard cover	4
Wrist Pro (wrist support)	20

12. LAPTOPS

AST	
386SX-20 Model 23V 2MB, 1.44FD, 20MB HD, DOS 3.3	$2445
CANON	
BJ-10e (Bubble jet printer, 4.5lb) See Printers Section #21	319
EVEREX	
Tempo LX 386-16SX, 1MB, VGA LCD 1.44FD, 20MB HD, DOS 4.01, 7lb	2095
Tempo LX 386-20SX 40MB HD	2595
Tempo LX 386-20SX 60MB HD	2895
2MB card	395
Battery	125
Charger	95
Modem	275
MICRONICS	
386-25, 4MB, 1.44FD, 40MB HD, DOS 4.01& Windows 3.0	call
PANASONIC	
CF-150B Backlit LCD 720K FD w/ carrying case	595
Battery for CF-150B	29
CF-170 8086 Backlit LCD 1.44 FD, 20MB HD	1575
SAMSUNG	
Notemaster 386SX-16 1MB, 1.44FD, 20MB HD 640x480 VGA display, Win 3.0 & Lap-Link	2095
TWINHEAD	
386SX-20 1MB, 1.44FD, 40MB HD, LCD	2329
TOSHIBA	
T1000SE / T1000XE	985/1195
T1200XE - 20 / 40	1875/2125
T1600X - 20	2235
2400 int modem	149
MEMORY for laptops Compaq, Epson, Everex, Nec, Panasonic, Sharp,Texas Instrument,Toshiba, Zenith	call

13. LASER PRINTER ACCESSORIES

ADOBE . . . see Adobe in Software section #23

AVERY	
Laser Printer Labels 1" x 2 5/8"	22
Laser Printer Labels for 5.25" diskettes	39
Laser Printer Labels for 3.5" diskettes	39
COMPUTER PERIPHERALS	
Jet Page (for HP II)	295
Jet Memory 1MB (for HP IIP, III)	109

HP . . . see HP in Printer section #21

IQ ENGINEERING	
Super Cartridge 1 for all HP Laser&True HP Compatibles	209
Super Cartridge 2 for HP II, IID, IIP, III, IIID	295
Super Cartridge 2 & 2LC	395
Super Cartridge 3 for HP III, IIID	275
Desk Jet 500 Std / Pro	115/145
Desk Jet Plus Std / Pro	105/145

PACIFIC DATA see top of next page
PANASONIC see Panasonic in section #21

MEMORY for Laser Printers Apple, Canon, Epson, HP, IBM, Konica, Okidadta Panasonic, QMS, Texas Instruments	call

14. MEMORY CARDS

EVEREX	
XT 2MB, EMS	$55
Ram 3000 Deluxe (AT 3MB, EMS)	84
Ram 8000 (AT 8MB, EMS)	165
Ram 10000 (AT 10MB, EMS)	125
Ram II 4000 (PS/2-5,6,7,80)	175
INTEL	
Above Board w/ 512K	295
MEMORY for Apple, AST, AT&T, Compaq, Dec, Dell, Epson Everex, HP, IBM, Nec, Sun, Zenith	call

15. MODEMS & FAX

EVEREX	
Evercom II (1200 Baud Internal)	$48
Evercom 2400 Baud Internal	84
Evercom 2400 Baud Internal w/ MNP5	139
Evercom 9600 Baud Internal v.32 w/ MNP5	495
Evercom 2400 Baud External w/ MNP5	185
Fax Modem 2400/9600 Internal w/ MNP5	239
Pocket Modem for Laptop 2400 w/ MNP5	215
FRECOM	
Fax 96	145
Fax 96 w/ 1 Liner & Far Fetch Fax	199
HAYES	
9600 v.42 & v.25 BIS	665
Personal Modem 2400	165
SmartModem 2400B Internal/ External	245/385
INTEL	
9600EX (9600 baud external modem)	515
SatisFaxtion card	395
VIVA (Computer Peripherals)	
2400 Baud External for IBM / Mac	99/125
2400 Baud External w/ send fax	119
2400 Baud External w/ MNP5(for IBM/Mac)	139

16. MONITORS

ADI	
14" VGA, 1024x768, .28	325
CONNERSTONE	
Dual Page Display mono	1095
Dual Page Controller	725
HITACHI	
CM2086MU 20", 1280x1024, .31, Non-Int	1795
MATSUSHITA	
ViewPerfect 2 14" VGA, 640x480, .29	295
ViewSonic 4 14", 1024x768, .29, Int	325
ViewSonic 5 14", 1024x768, .25, Non-Int	545
MITSUBISHI (w/ base)	
HL6605ATK 16", 1280x1024, Non-Int	995
HL6935ATK 20", 1280x1024, .31, Non-Int	1795
Cable	45
NANAO	
9070U 16", 1024x768, .28, Non-Int	995
9080i 16", 1280x1024, .28 Non-Int	1355
NEC	
2A 14", 800x600, .31	439
3D 14" Multisync, 1024x768, .28, Int	595
3DS 14", 1024x768, Int	595
4D 16", 1024x768, .28, Non-Int	995
5D 20", 1280x1024, .31	1995
Plus 14" Multisync, 1024x768, .31, Non-Int	555
PANASONIC	
1381 14" Super VGA, 1024x768, .28	345
POWER II	
3E 14" Super VGA, 1024x768, .31, Int	305
4E 14"Multisync, 1024x768, .28, Non-Int	399
QUME	
835 14", 1024x768, .28, Int	335
SAMSUNG	
MA2565 12" mono amber	75
ML4571 14" VGA mono	125
CJ4686 14" VGA, 640x480, .52	225
CT4581 14" Super VGA, 800x600, .31	325
CVB4581 14", 1024x768, .31, Int	325
CVB4997 14", 1024x768, .28, Int,Non-glare	345
CSA 7571 17", 1024x768, .31, Non-Int	895
SEIKO	
CM1450 14", 1024x768, .25, Non-Int	599
CM2050 20", 1024x768, .31, Non-Int	1650
SONY	
1304 14", 1024x768, .25, Non-Int	625
STANDARD TECHNOLOGIES	
428UVGA 14", 1024x768, .28, Non-Int	445
TAXAN	
UV1000 20", 1280x1024, .31, Non-Int refurbished / new	1450/1850

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Fax: (408) 241-0390

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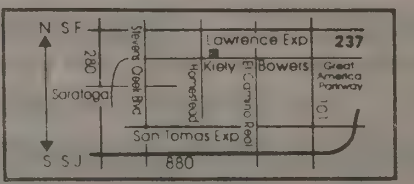
Sat 10:30am-6pm • Sun 12:30-6pm



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- Financing plan available OAC
- Prices are subject to change w/o notice and to stock on hand
- All brand names are registered trademarks
- Not responsible for typographical errors

PACIFIC for HEWLETT PACKARD

DATA PRODUCTS

FONT CARTRIDGES

25 in One! III (for HP II, IID, IIP,III)	245
Complete Font Library (for HP III, IIID)	255
Font Bank (stores soft fonts)	205
Headlines Cartridge (for HP II, IID, IIP)	185
Pacific Outlines I / II (for HP III, IIID)	185

POSTSCRIPT Emulation

Pacific Page & 2MB (for HP II)	389
Pacific Page P.E. (for HP IID,IP,III,IIID, IIIP)	325
Pacific Page XL (for HP IIP,III,IIID)	715
Pacific Page P.E. & Pacific Talk for Mac & HP IID,IIP,III,IIID	450
Pacific Page XL & PacificTalk	845
Pacific Type	265

MEMORY

1-2-4 Plus (for HP II, IID)	
1MB	$139
2MB	179
4MB	269
Pacific 4 Memory (for HP IIP, III, IIID, IIIP)	
1MB	109
2MB	149
4MB	239
LP Memory (for IBM 4019E)	
1MB	129
2MB	179
3.5MB	249
Pacific T Memory (for Epson 6000)	
2MB / 4MB	209/299

OTHERS

Driver & cable for Mac & HP II,IP, IID, III	$115
Pacific Bar Code (for HP II)	315
Pacific Bar Code P.E. (for HP IID, IIP, III)	315
Palcfic Connect (for HP II, IID, IIP, III, IIID) connect up to 5 PC and/or Mac to a printer	
256K	265
1.25 MB	299
Pacific Print (for network & HP II, IID, IIP, III, IIID)	225
Plotter in a Cartridge (for HP II)	225
Plotter in a Cartridge P.E. (for HP IID, IIP, III, IIID)	225

17. MOTHERBOARDS

286-12/16	$99/125
AMI	
386-33M4/ 25M3 w/ 64Kcache	1095/975
DTK	
386SX -16 / 20	265/325
386-25 w/o cache	495
386-33 64K cache	745
VLSI	
286-12	115
MICRONICS	
386SX-16	245
386SX-20 Multi I/O w/ IDE on board	325
386-25 (no cache) BMP-ASIC	515
386-25 64K cache BCP-ASIC	685
386-33 64K cache ACP-ASIC (2S 1P, IDE adapter on motherboard)	825
386-33 64K cache BCP-ASIC	745
486-25 64K cache ISA/EISA	1150/1850
486-33 64K cache ISA/EISA	1595/2095
MICRONICS ACCESSORIES	
4MB Piggy Back (to 8MB)	455
16MB Memory Card	150
32K 2-Way cache	55
387 Adaptor	65
BOIS Award / Phoenix (386)	60/pair
Keyboard Chip	30

18. MOUSE

APPOINT	
MousePen Pro (portable)	$69
LOGITECH	
C-9 Mouse Serial / Bus	59/67
Catchword	99
Cordless Mouse	129
Dexxa serial mouse	27
Mouseman Serial / Bus	64/71
Scanman Plus / 256	139/275
Trackman Serial / Bus	80/85
Trackman Portable Serial	99
MICROSOFT	
Ball Point Mouse (new)	119
Mouse Serial 200PPI	69
Mouse Serial / Bus 400PPI	89
MOUSE SYSTEMS	
Omni Mouse II	29
PC Mouse III	69
PC Trackball	49
The White Mouse w/ Power Panel	56

19. NETWORK

3COM	
3C503 8 bit	199
5 packs (5 boards 1 manual)	799
3C503-TP 8 bit / 5 packs	269/1160
3C505 16 bit, 256K / 5 packs	579/2620
3C507 16 bit / 5 packs	289/1250
ANTISOFT	
Lantastic AE-2 Ethernet starter kit 10Mbps	475
Lantastic AE-2 Ethernet adapter 10Mbps	225
Lantastic AE-2 Ethernet 64K RAM upgrade	45
Lantastic AE-2 Ethernet boot ROM	45
Lantastic /AI software	75
HAYES	
Ethermate 8 ethernet adapter 8 bit	109
WESTERN DIGITAL	
Ethercard Plus Elite 8bit / 16 bit	145/185
Netware Boot Rom	34
CABLES & ACCESSORIES	
RG58 (BNC Male Connectors on each end) Thin Ethernet Cable 10'/25'/50'	15/20/30
RG58-Twist	3
RG58-Crimp	2.80
RG58 50 Ohm Terminator	4.50
BNC "T" Connector F/M/F	4.50

20. POWER SUPPLIES

150W / 200W (XT)	$45/55
200W for Baby AT & Tower	55
230W (AT)	58
230W for Tower	69
Leadman (UPS) 330W / 500W / 1200W (UPS)	199/399/999
Dakota PowerSave500 (200W UPS Internal)	129

21. PRINTERS

CANON	
BJ-10e w/ bag (Bubble jet)360 dpi,37K buf	$319
Auto Sheet Feeder	85
Battery / Print Head Cartridge	45/22
CITIZEN	
GSX 200 (9 pin)	165
GSX 140 (24 pin)	279
Color Option for above printers	45
Auto Sheet Feeder for GSX 140	129
GSX 145 (24 pin, 132 column)	399
Color option for GSX 145	65
EVEREX ABATON	
Postscript Laser (3MB)	1395
FUJITSU	
DL 1100 mono / color	295/339
DL 4600 5-part form, bar code printing mono / color	995/1129
HEWLETT PACKARD	
Desk Jet 500	489
Laser Jet III w/ toner	1515
Laser Jet IIID w/ toner	2495
Laser Jet IIIP w/ toner	1049
Accessories:	
Envelope Cassette (15 envelopes)	69
Envelope Feeder for IIID	295
HP Postscript Cartridge	495
Legal Tray for HP II & III	69
Lower Cassette for IIP	160
Paper Tray for IIP	69
Toner for HP II / IIP/ III/ IIIP	85/75/85/75
PANASONIC	
1180 / 1123 / 1624	165/229/375
32K Buffer for above printers	65
Serial interface card	69
4420 Laser	829
1MB Memory Card	169
Developer KX-PDP2	95
Drum KX-PDM2	99
Envelope Tray KX-P431	59
Fonts Card	95
Legal Tray KX-P425	45
Toner KX-P451	39
4450i Laser	1175
1MB Memory Card	169
Developer KX-PDP1	95
Drum KX-PDM1	145
Envelope Tray KX-P430	59
Fonts Card	95
Legal Tray KX-P420	45
Toner KX-P450	35
4455 (Postscript) same as 4450i	1975
QMS	
QMS-PS 410 4ppm, 2MB, 45 Fonts	1875
1MB / 2MB / 4MB Memory	129/179/269
Envelope Tray	69
Legal / Letter Tray	69
Lower Paper Cassette	160
Toner	95
QMS-PS 810 8ppm, 2MB	2735
QMS-PS 2210 / 2220	call
ColorScript 100-10 4MB, 35 Fonts	6595
ColorScript 100-30i	call
SEIKO	
Smart label Printer (IBM/APPLE)	175
PELICAN	
All type ribbons	visit us
Toner for Laser Printers	visit us
MEMORY for Laser Printers	
Apple, Canon, Epson, HP, IBM, Konica, Okidadta Panasonic, QMS, Texas Instruments	call

22. SCANNERS

DEST Personal Scan hand held & automatic document feed capabilities in one desktop unit, 64 level of halftone gray, w/ Reconize! and Image-in software	795
MICROTEK MSF-300Z flatbed 16.8 mil colors, 256 shades of gray w/ Photostyler (image processor)	1595
PLUSTEK ScanPlus sheet-fed, comes with Calera Wordscan & Picture Publisher Plus	
8 bit output gray	695
16.8 mil colors, 8 bit output gray	895
Hand scanners	see Logitech in section #18

23. SOFTWARE

ADOBE	
Complete Type Library	call
Illustrator for Mac / Windows 3.0	335/285
Plus Pack for Mac / Windows 3.0	119
Photoshop for Mac	555
Postscript Cartridge for HP II	299
Streamline for Windows 3.0	225
Type Align for Windows 3.0	59
Type Cartridge 1: Display Faces	215
Type Cartridge 2: Best Sellers	225
Type Manager for Mac / Windows 3.0	59
Type Set 1/2/3 for Mac / Win 3.0	75/75/105
MICROSOFT	
DOS 3.3 / 4.01	65
DOS 5.0 (new)	65
DOS 4.01 w/ Windows 3.0	119
Entertainment Pack for Windows 3.0	35
Excel for Windows 3.0	299
Flight Simulator	39
Maxx Control Yoke / Pedals (IBM)	57/39
Maxx Instrument Flight Training	66
Learning DOS	35
Microsoft C 6.0	309
Microsoft C Compiler & software dev. kit	465
Mouse w/ Paintbrush	99
Mouse w/ Windows 3.0	157
Office 1.6(Excel, Word, Power Point, Mail)	455
OS/2 Presentation Manager Tool Kit 1.21	309
PC Mail Server for DOS & Windows	435
Power Point for Windows	279
Productivity Pack for Windows	38
Project Management 4.0	309
Project for Windows 1.0	425
Quick Basic 4.5	62
Quick C Compiler w/ Quick Assembler	125
Software Development Kit 3.0	309
Visual Basic	129
Windows 3.0	69
Word 5.5 / Word for Windows	207/299
Works 2.0 / Works w/ Mouse 2.0	99/159
MICROSOFT FOR MACINTOSH	
Mail Server 3.0 / Excel 3.0	259/299
Office (Word, Excel, Powerpoint, Mail)	519
Powerpoint 2.01	259
Word 4.0 / Works 2.0	255/199
WORDPERFECT	
$100 rebate for student / faculty members Free Licenses for schools call for details	
DataPerfect / DrawPerfect	260/255
LetterPerfect / PlanPerfect	125/235
WordPerfect 5.1 for DOS	239
WordPerfect 2.0 for Mac	239
WordPerfect Executive / Office	145/95
OTHERS	
After Dark (screen saver)	35
Ashton-tate Multimate 4.0	249
Atech Publisher's Powerpak	39
Borland Object Vision for Windows	99
C++ Profession for Windows	299
Turbo C++ (Dos Version)	95
Turbo Pascal for Windwos	159
Turbo Pascal Professional 6.0	199
Central Point Backup 6.0 / Anti-virus	65/69
PC Tools 7.0 w/ Anti-Virus	109
Corel Draw 2.0	349
Davidson Education Algebra/ Read/ SAT/ Spelling	30 & under
Definition Plus! (American Heritage Dict.)	60
Fastback Plus	112
Geoworks Ensemble	129
Grammatik IV 2.0	57
Grammatik IV for Windows	57
hDC Windows Express	55
HP New Wave 3.0	109
Hardvard Graphics 3.0	395
Individual (Learning Software)	39 & under
Labels Unlimited 3.0	57
LapLink Rel 3	95
Lotus 1-2-3 Rel 3.1	379
MacPrint	85
More Fonts	79
Norton Commander 3.0	84
Norton Utility 6.0	112
PFS: First Choice (w/ Prodigy start-up kit)	79
Pacioli 2000	24
PageMaker for Windows 4.0	469
Personal Lawyer/ Lifestyles	55
Pro-scan (virus identifier & remover)	55
Quarterdeck DesqView 286/386 v2.3	79/125
Qemm 386 v5.1 /Manifest /Qram	64/45/45
Quicken for IBM/Mac	39
Readright 2.01	305
Software Source (Public Domain)	3
Sound Blaster	145
CMS Chip / Speaker / MIDI kit	29/29/59
Ventura Publisher Gold for Windows	485
Wordstar 6.0	175
XTree Gold 2.0	95

24. TAPE BACKUP

AT & T	
40MB	$185
COLORADO	
DJ-10 (40,60,120MB)	245
DJ-20 (250MB)	329
AB-10 Controller for DJ-10	75
FC-10 Controller	95
CK-17 Cable	20/9
KE-09 Ext kit w/o controller	75
KE-10 Ext Hardware kit for PC, XT, AT	119
EVEREX	
(with software, cassette/cartridge)	
60MB (DC600A)/ Ext	645/765
250MB (DC6250)/ Ext	757/865
60MB-PS/2 (DC600A)/ Ext	765/875
250MB-PS/2 (DC6250)/ Ext	875/995
60MB AT Floppy w/o media	225
60MB AT Floppy Ext w/ power	395
40MB PS/2 Floppy (50,60,70,80) (DC2000) w/o media	265
All sizes of cassette	visit us

25. VGA CARDS

All VGA cards come 1024x768
except as stated

ATI	
Wonder Plus w/ mouse 512K/1MB	$209/229
ATI chipset 256K/512K	95/115
DIAMOND Speedstar Plus 1MB	199
EVEREX	
EGA Card	59
Viewpoint Standard (800x600)	75
Viewpoint 256K/512K	129/149
VRAM (1MB DRAM)	235
GENOA	
6300 256K/ 6400 512K	95/115
6400A 512K	199
HERCULES	
Graphics Station 1MB	650
upgrade 2MB (to total 3MB)	335
ORCHID Prodesigner II 1MB	245
PARADISE	
1024 256K/512K	129/149
8514/A Plus	449
512K memory upgrade (to total 1MB)	205
Paradise chipset 256K/512K	79/99
PHOTON	
Ultima Turbo (1280x820, 1024x1024)	335
VIDEO SEVEN	
1024I 256K/512K	165/185
SPEA 1280 (1280x1024)	1895
VRAM 512K	365
VRAM II 512K	365
upgrade to 1MB	165

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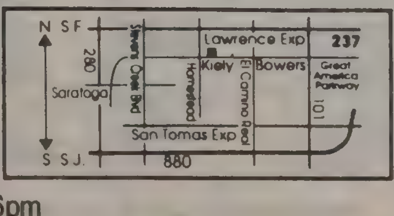

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- Financing plan available OAC
- Prices are subject to change w/o notice and to stock on hand
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Calendar Of Events continued

August 4 Computer Show & Sale. Emeryville. MarketPro. Call: (415)388-8893.

August 4–8 The International Conference On APL. Stanford University. ACM & SIGAPL. Call: (415)326-7781.

August 10 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 10 Computer Show & Sale. Alameda County Fairgrounds. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

August 10 Computer Show & Sale. San Francisco. MarketPro. Call: (415)388-8893.

August 12 Automating Your Accounting System Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 12 Wireless Networking And Novell NetWare Featuring Motorola's Altair 10MB Wireless Ethernet Network Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 12–14 Intro To C++ For C Programmers Course. Techmart. UC Extension. Call: (408)427-6636.

August 13–16 Optimizing/Customizing AutoCAD, Level I Class. San Francisco. SFSU Extended Education. Call: (415)338-1205.

August 13 & 20 Macintosh Office Management Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 14 Real Estate Management With Platinum Series Software Seminar. Sacramento. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

August 15 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

August 15–16 Object-Oriented Design And Programming In C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 16 Quattro Pro Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 16 Troubleshooting A Novell Network Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 16–18 FidoCon '91: The 1991 International BBSing And Electronic Communications Conference. Denver. Call: (303)426-1847.

August 17 Computer Show & Sale. Cow Palace. Computer Swap. Call: 1-800-533-7220. BBS: 1-800-464-6408.

August 17 Repair And Troubleshooting A PC Clone Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

August 18 Computer Show. San Francisco. Ft. Mason Shows. Call: (916)725-0228.

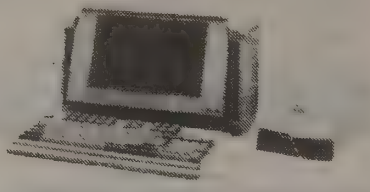
August 19 Installing NetWare v2.2 For Consultants And Technicians Seminar. Oakland. Informational Data Networks. Call: 1-800-348-5855.

August 19–21 C++ Programming For The Macintosh Course. Techmart. UC Extension. Call: (408)427-6636.

August 19–23 SCO Forum91: The International SCO Technology And Marketing Conference. Santa Cruz. SCO. Call: 1-800-

Continued on page 242

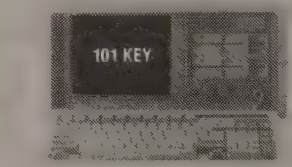
VGA PORTABLE
GAS PLASMA /LCD



- 80386SX16, 1MB RAM, 40MB HD
- VGA 648X480, 16 gray scale
- 2ser 1par, carrying bag

$1795 68/mo $1595 60/mo

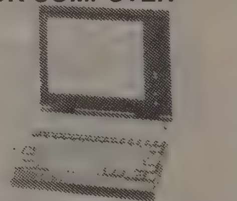
McTEK 386-25
CRT SVGA PORTABLE



- **80386-25,** 4mb exp. to 16mb, 1.2mb fd
- **120mb, 34 lbs**
- 2 Serial 1 par port, svga

$2569 102/mo

TI TRAVELMATE 2000/3000
NOTEBOOK COMPUTER

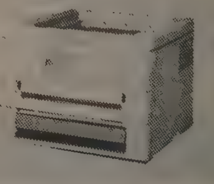


IN STOCK

- 80286-12/80386SX20 VGA (LCD 640X480)
- 1/2MB RAM expandable to 3/5MB
- 20MB hd(40/60hd optional)Weight 4.4/5.7lbs

TI2000 $1559/TI3000 $BEST

TI Postcript Laser Printer



- Affordable Postscript Laser Printer,
- 6ppm, **AppleTalk optional**

PS17 $1259/PS35 $1495
$47/mo $56/mo

McTEK 286-16/386-16SX

- 80286-16/386-16sx
- 1MB EXP. TO 16MB
- 8 Expansion slots
- 1.2MB w/FHDC (1.44MB Optional)
- 2 Serial 1 Parallel
- 101 Enhenced keyboard
- 40MB Hard Disk (25ms)
- One year Warranty Parts & Labor

$609/ $695
$23/mo $28/mo

McTEK 386-25/386-25 cache

- 80386-25/386-25 WITH CACHE
- 1MB EXP. TO 16MB
- 8 Expansion slots
- 1.2MB w/FHDC (1.44MB Optional)
- 2 Serial 1 Parallel
- 101 Enhenced keyboard
- 40MB Hard Disk (18ms)
- One year Warranty Parts & Labor

$ 889 / $999
$37 /mo 39/mo

McTEK 386-33/486-25

- 80386-33/486-25 WITH CACHE
- 1MB EXP. TO 16MB
- 8 Expansion slots
- 1.2MB w/FHDC (1.44MB Optional)
- 2 Serial 1 Parallel
- 101 Enhenced keyboard
- 40MB Hard Disk (18ms)
- One year Warranty Parts & Labor

$ 1069 / $1869
$60/mo $72/mo

McTEK 486-33/EISA

- 80486-33 WITH 128K CACHE
- 4MB EXP. TO 16MB
- 8 Expansion slots
- 1.2MB w/FHDC (1.44MB Optional)
- 2 Serial 1 Parallel
- 101 Enhenced keyboard
- 40MB Hard Disk (18ms)
- One year Warranty Parts & Labor

$2299 / $3399
$86/mo $120/mo

MONITORS/VIDEO CARDS

Hercules graphic Station card (1024X768 256color)	**$659**
Hercules 2MB upgrade	$325
The Hercules Art Dept.	$2399
VGA card 16bits	$ 89
ATI VGA wounder	$135
Prodesign II w/512K	$199
Sony 1304 multiscan	$619
Seiko 1440 VGA	$499
Seiko 1450 VGA	$645
NEC 3DS	$599
NEC 4D	$1150
SVGA monitor(1024x768)	$335

PRINTERS

HP LaserJet III	**$1529**
HP LaserJet IIIP	**$ 1059**
HP IIP	$829
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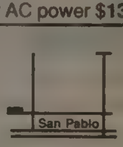

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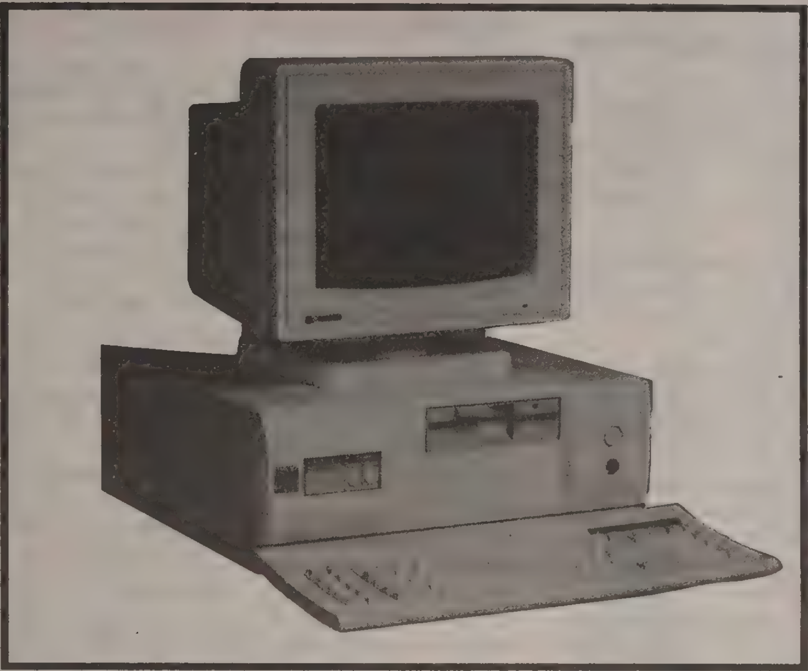

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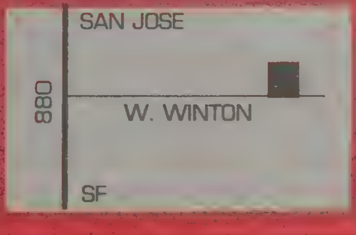

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AMIGA

AAA (Amiga Addicts Anonymous). Meetings: 3rd Tues., Concord Water District Bldg., 1311 Concord Ave. Classes, BBS, pub. dom. disks, info line. Call: (415)935-0829. [Exp. #88.]

ACCESS—Amiga & Commodore Computer Enthusiasts Society. Meetings: 2nd Thurs., 7:00 pm, Livermore Airport Ter-

PROFESSIONAL ASSOCIATIONS

Association for Women in Computing. Meetings: 1st Wed., 5:30 pm, San Francisco Marriott. Call: (415)979-8450. [Exp. #86.]

The Association for Worldwide Software Support Management. Meetings: 2nd Tues., Milpitas Sheraton. Call: Mikael Blaisdell, (415)865-1323. [Exp. #88.]

Computer Professionals for Social Responsibility. Meetings: 2nd Wed., 7:30 pm, UC Berkeley, Evans Hall, room 608-7. Call: Judy Stern, (415)643-7499. [Exp. #84.]

Data Processing Management Association. Call: (415)978-0868. [Exp. #89.]

Independent Computer Consultants Association. Meetings: 2nd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #86.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:15 pm, San Rafael. Call: Harry Chapman, (415)291-0174. [Exp. #87.]

Society for Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 7:30 pm. Call: Marla Wilson, (415)549-3801. [Exp. #89.]

Society for Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. Call: September Jenner, (408)971-2336. [Exp. #88.]

Society for Technical Communications, East Bay Chapter. Meetings: 1st Thurs. Call: Corinne Stefanick, (415)769-8931. [Exp. #88.]

Society for Technical Communications, San Francisco Chapter. Meetings: 3rd Wed. Call: (415)985-7121. [Exp. #88.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #86.]

United Sysops Association. Meetings: 2nd Wed, 7:00 pm, Coco's, 1035 S. Mary Ave., Sunnyvale. Assoc. for system operators and BBS users. Call: Bill Strouse, (408)453-3321. [Exp. #84.]

Women's Computer Society. Meetings: Last Tues. Call: Tanya Halepota, (415)949-3936. [Exp. #85.]

Writer's On-line Association of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #86.]

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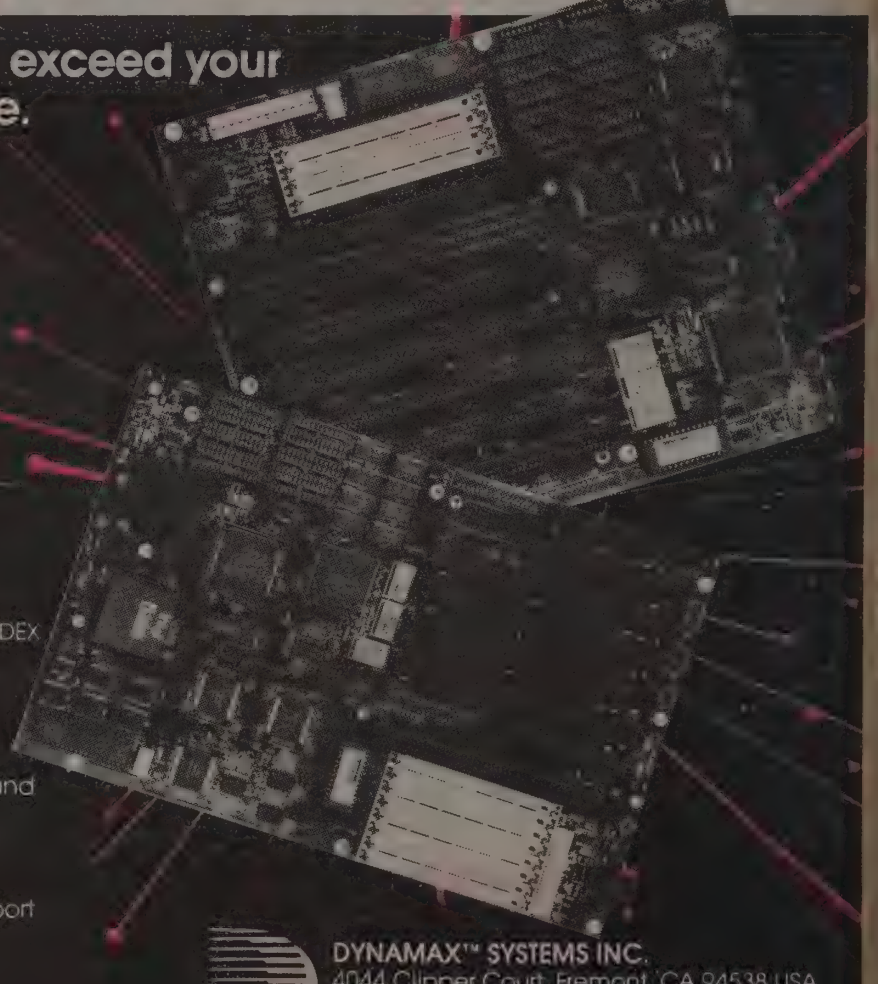

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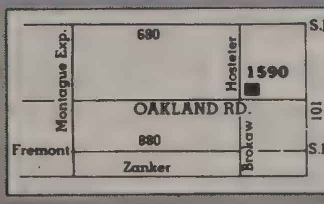

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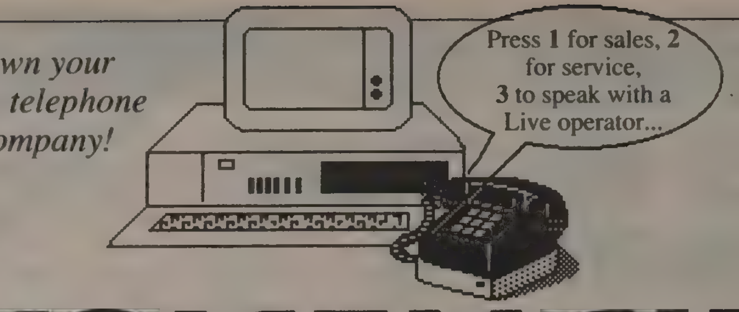
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minal. Call: Paul, (415)826-6053. [Exp. #88.]

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Beginners group. Call: (408)262-9334. [Exp. #85.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, 2739 Geary. Call: (415)584-8406. [Exp. #87.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:00 pm, Palo Alto Hyatt. Call: Mike Fisher, (415)855-9426, BBS (415)595-2679. [Exp. #84.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm. Variable. Call: Tibor Horvath, (415)283-5611. [Exp. #86.]

APPLE

San Francisco Apple Core. Meetings: 3rd Tues., 7:00 pm, SF State University, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #84.]

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Apricot User Group, East Bay Chapter. New members welcome. Call: Ron, (415)828-9643. [Exp. #85.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #84.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #84.]

AT&T Computer Users Group. Meetings: 2nd Wed., 6:30 pm. Refreshments, technical support and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #84.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #84.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. Call: (415)469-7924. [Exp. #88.]

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #86.]

COAST User Group. Meetings: 3rd Wed., 1514 University Ave., Berkeley. Specializing in DTP, CAD, and serious use. Call: Bill Yerger, (415)548-8999, BBS (415)845-1789. [Exp. #85.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Public Library. Atari Club, 8/16/32-bit. Call: Keith Sammons, (415)887-2008. [Exp. #84.]

Santa Clara County Atari Users Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computer Showroom, 1278 Alma Court. Formerly South County Atari Users Group. Call: Ron Reade, (408)225-7162, BBS (408)848-6032. [Exp. #88.]

CAD/CAM

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #84.]

Marin ACAD User Group. Meetings: 1st. Thurs. Call: Gigi Bollinger-Himes, (415)491-4722. [Exp. #84.]

S.F. AutoCAD User Group. Meetings: 1st Mon. Call: Mark Williamson (415)383-4060. [Exp. #89.]

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #84.]

Textile Computer Users Group—TCUG. Meetings: Bimonthly, 1st Sun., 10:00–noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #84.]

COMMODORE

Commodore Hayward User Group. Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (415)793-2514. [Exp. #87.]

Cupertino Chapter of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #85.]

CWEST Commodore 64/128. Meetings: 3rd. Wed., 7:00 pm, Fort Mason. For info: 1564 Waller #B, San Francisco, 94117. Call: (415)626-9946. BBS, (415)626-9946. [Exp. #87.]

North Valley Chapter of 64/More Commodore User Group. Meetings: 2nd Sat, 10:00 am. Milpitas Library. Call: (408)262-9334. [Exp. #85.]

COMMUNICATION

Toastmaster International. Meetings: Every Wed., 6:00 pm, Laguna Honda Hospital, San Francisco. Improve your communication and presentation skills. Call: Maurine Martin, (415)882-7335 or (415)759-0634. [Exp. #84.]

dBASE

dBASE IV SIG. Meetings: 1st Tues., Ashton-Tate, 6411 Guadalupe Mines Rd., San Jose. SIG of the Silicon Valley dBase Language Group. Call: Charles King, (408)724-7024. [Exp. #84.]

East Bay Database User Group. Guest speakers. Call: David Chilcott, (415)653-1303, BBS (415)652-1763. [Exp. #85.]

SQL_Forum. Meetings: 1st Thurs., 6:30 pm, 394 Pacific Ave., San Francisco. Topics include client/server computing & SQL database servers. Speakers, demos. Call: (415)695-2748. [Exp. #84.]

SVDLG dBASE SIG. Meetings: 1st Tues., 6:30 pm, ASI, ABSI Birchwood Systems, Suite 480 W., 2001 Gateway Place, San Jose. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

SVDLG FoxPro SIG. Meetings: 2nd Thurs., 6:30 pm, ASI, ABSI Birchwood Systems, Suite 480 W., 2001 Gateway Place, San Jose. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

DESKTOP PUBLISHING

Bay Area DTP User Group. Meetings: 1st Tues., 7:00 pm, Nisha Software, 2493 Telegraph Ave., Berkeley. Call: Dr. C.J. Wallia, (415)848-8200 or 548-7712. [Exp. #88.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #86.]

FOURTH

Fourth Interest Group of North Bay. Meetings: 2nd Sat., 1-5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #87.]

Fourth Interest Group of San Francisco. Meetings: 1st & 3rd Tues., 6:00 pm. Walk to dinner. Call: John Peters, (415)239-5395. [Exp. #87.]

IBM AND COMPATIBLES

EastBay FOG. Meetings: 2nd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #87.]

Napa Valley PC User Group. Meetings: 2nd Wed., 7:30 pm, 10 Chapel Hill Dr., Napa. Call: Lee Schwab, (707)257-2675. [Exp. #85.]

PC Clubhouse. Meetings: 1st Fri., 8:00 pm, Meiklejohn Hall, CSU Hayward. Many SIGs. CV BBS: (415)581-8529. San Leandro BBS: (415)357-9577. Call: Roberta, (415)429-1007. [Exp. #87.]

San Francisco Business Computers. Meetings: 4th Thurs., 5:30 pm. For those who use computers in business. Visitors $5. Call: (415)788-5338, ext. 444. [Exp. #88.]

San Lorenzo User Group. Meet-

continued

ings: 2nd Tues. and the 20th, 7:00 pm, Gathering Place in Ben Loman, Santa Cruz County. Call: Chuck Schafer, (408)338-7348, BBS (408)335-4672. [Exp. # 86.]

KNOWLEDGE-MAN

Bay Area KnowledgeMan (and Guru) User Group. Meetings: 1st Tues, 6:30 pm., JNZ, Inc., 826 Las Trampas Rd., Lafayette. A forum for discussion and info concerning mdbs products, esp. KnowledgeMan and Guru. Call: (415)947-4878. [Exp. #89.]

LAPTOPS

Bay HPX HP Laptops & Handhelds. Meetings: 2nd Sat. Call: Michael Felsenstein, (415)564-8279. [Exp. #84.]

MACINTOSH

MacSEF. Meetings: 3rd Tues., 7:00 pm, Call: Tony Meadow, (415)644-9400. [Exp. #84.]

North Coast Mac Users Group. Meetings: 3rd Thurs., 7:30 pm. Lark 2004, Santa Rosa Jr. College. SIGs on development, programming, and multimedia authoring, networking, graphics, and more. Call: Reed Hopkins, (707)542-1089, BBS (707)792-1871. [Exp. #85.]

SPC Apple User Group. Meetings: 2nd Wed., 7:30 pm, Fremont Main Public Library. The **S**ociety for **P**revention of **C**ruelty to **Apple** Computers User Group supports all Apple and Macintosh computers. Call: Jim Weil, (415)796-7169. [Exp. #88.]

Women's Macintosh User Group. Meetings: 2nd Tues., 7:00 pm, ComputerWare, Palo Alto. Call: Buffy Joseph, (415)792-2840 or Tayna Halepota, (415)949-3936. [Exp. #88.]

MULTIMEDIA

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #88.]

MUSIC

Computer Music SIG. MIDI and beyond. All computer types welcome. Call: Bob Brander, (415)592-6993. [Exp. #86.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)747-4356. [Exp. #87.]

NEURAL NETWORKS

Neural Networks SIG. SIG for Neural Networks and its applications. Call: Kumar, (408)946-5835. [Exp. #88.]

NEXT

BANG—Bay Area NeXT Group. Meetings: 3rd Wed., 7:00 pm, Terman Aud., Stanford. Presentations and lectures. [Exp. #87.]

NOVELL

The East Bay Novell Users Group. Call: George M. Gold, (415)444-4899. [Exp. #86.]

Sacramento NetWare User Group. Call: Charles Raley, (916)752-9561. [Exp. #89.]

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Coco's, 1305 S. Mary Ave., Sunnyvale. Call: Bill Strouse, (408)453-3321. BBA (408)453-3326. [Exp. #86.]

The San Francisco Novell Users Group. Call: Thomas Thibault, (415)944-9500. [Exp. #86.]

PARADOX

Bay Area Paradox User Group—BAPALS. Meetings: 4th Tues., 4:00 pm, SF State University Downtown Campus. Forum for users and developers at all levels. Call: Robert Smiley, (415)957-4656. [Exp. #87.]

PROGRAMMING LANGUAGES

SVDLG C SIG. Meetings: 3rd Mon., 7:00 pm, Techmart, Santa Clara. Call: Fletcher Johnson, (408)283-1333. [Exp. #85.]

RACES

California Races Group. Meetings: Tues., 7:00 pm, 1491 River Park Dr., Sacramento. Technical discussions on computerized emergency communications. Call: Jim West, (916)991-5505. [Exp. #87.]

R:BASE

R:Base Users Group of Oakland. Meetings: 2nd Thurs., 9:00 am. Call: Longwell Assoc., (415)451-5316. [Exp. #87.]

UNIX/XENIX

UNIX SIG. Meetings: 2nd Tues., Oracle Corp. Fitness Center, Redwood Shores. Sponsored by Software Entrepreneurs Forum. Call: Priscilla Rowe, (415)776-0513. [Exp. #85.]

WORDPERFECT

South Bay WordPerfect User Group. Meetings: Saratoga Community Library. Dates vary, free. Call: Martin Van Derpool. (408)238-8434. [Exp. #85.]

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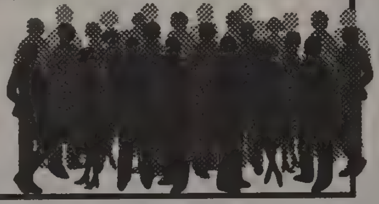

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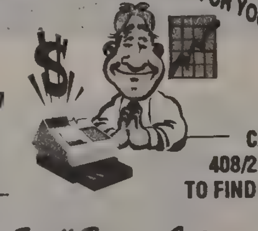

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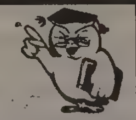

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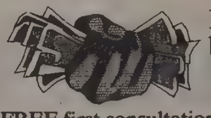

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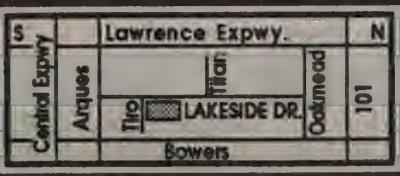

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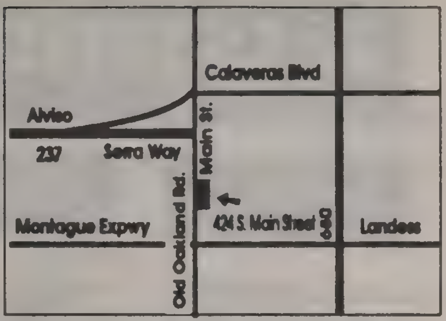

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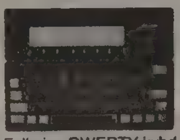

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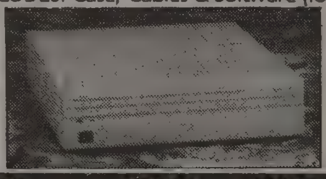

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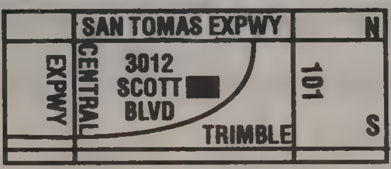

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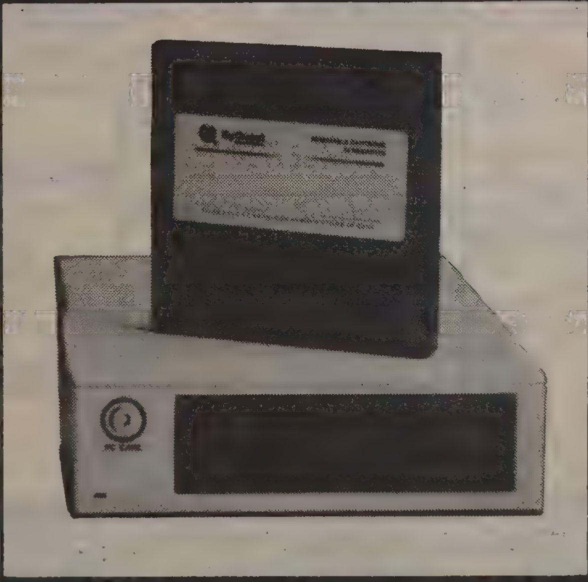

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- Intel CPU, Made in USA Motherboard
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- Hyundai Super VGA Monitor (1024x768 w/.28 Dot Pitch)
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- 2 Serial, 1 Parallel, 1 Game port, I/O Card
- Maxiswitch 101-Key Enhanced Keyboard
- Desk Top or Tower Case w/ Power Supply

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386SX-20 w/32K Cache

44MB Hard Drive — Super VGA System

- Intel CPU, Made in USA Motherboard
- 1 MB (expandable to 16 MB Onboard)
- 44 MB Seagate 28ms IDE Hard Drive
- Texas Instruments Chipset
- Genoa 6400 Super VGA Card w/512K
- Hyundai Super VGA Monitor (1024x768 w/.28 Dot Pitch)
- Teac 1.44 MB 3.5" Floppy Drive
- Teac 1.2 MB 5.25" Floppy Drive
- 2 Serial, 1 Parallel, 1 Game port, I/O Card
- Maxiswitch 101-Key Enhanced Keyboard
- Desk Top or Tower Case w/ Power Supply

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44MB Hard Drive — VGA System

- Intel CPU, Made in USA Motherboard
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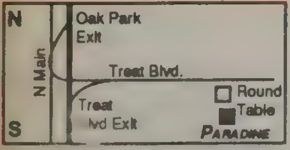

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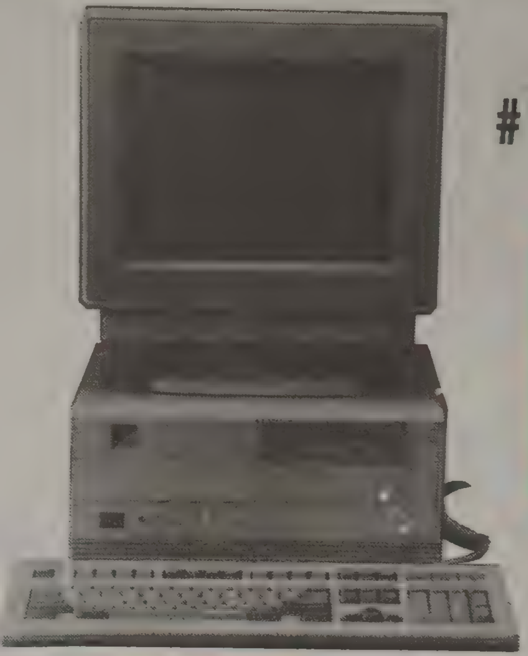

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- Enhanced Keyboard
- Serial/Parallel Port
- Socket for 387 Processor

Mono 40MB	SVGA* 40MB	SVGA* 80MB
$999	$1399	$1549

GREAT PRICE

386-33 System

Complete System
w/Hard Drive & Monitor

- 33 MHz - 0 Wait State
- 64K Cache Memory
- 2MB RAM, expands to 8MB
- IDE Hard Disk Drives
- 1.2 MB Drive
- Enhanced Keyboard
- Serial/Parallel Port

Mono 40MB	SVGA* 40MB	SVGA* 80MB
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- 4 MB RAM
- 1.2 & 1.44 Floppy Drives
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- Enhanced Keyboard
- Tower Case

Mono 40MB	SVGA* 40MB	SVGA* 80MB
$2199	$2599	$2749

386SX-16 System

w/Hard Drive & Monitor

- 16 MHz
- 1MB RAM, expands to 8MB
- IDE Hard Disk Drives
- 1.2 MB Floppy Drive
- Enhanced Keyboard
- Serial/Parallel Port
- Socket for 387 Processor

Mono 40MB	SVGA* 40MB	SVGA* 80MB
$899	$1299	$1449

286 System

w/Hard Drive & Monitor

- 12 MHz - 0 Wait State
- 1MB RAM, expands to 4MB
- 1.2 MB Floppy Drive
- Enhanced Keyboard
- Serial/Parallel Port

Mono 40MB	SVGA* 40MB	SVGA* 80MB
$699	$1099	$1249

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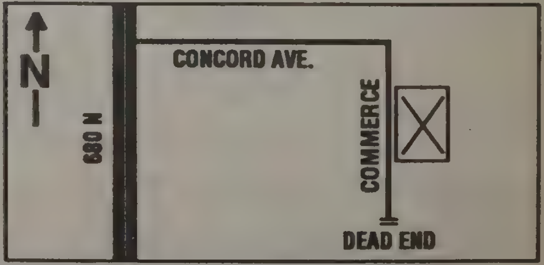

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Please indicate number of copies desired. Xerox copies OK.

I want to receive MicroTimes

☐ Yes ☐ No

# of Copies Desired ________

A. Which one category best describes your company?

- ☐ 01 Manufacturing of computer equipment, computers, DP hardware, peripherals
- ☐ 02 Software development
- ☐ 03 Manufacturing
- ☐ 04 Agriculture, Mining, Construction
- ☐ 05 Transportation
- ☐ 06 Communications
- ☐ 07 Utilities
- ☐ 08 Finance, Banking, Insurance
- ☐ 09 Real estate
- ☐ 10 Health, Medical service
- ☐ 11 Legal
- ☐ 12 Education
- ☐ 13 Data processing, Computer service
- ☐ 14 Government
- ☐ 15 Consultant
- ☐ 16 Wholesale/Distributor
- ☐ 17 Research/Development
- ☐ 18 Engineering/Architecture
- ☐ 19 Advertising
- ☐ 20 Sales/Marketing
- ☐ 21 Personnel Placement
- ☐ 22 Entertainment
- ☐ 23 Other

B. Which one category best describes your job title?

- ☐ 01 Owner, Partner, President
- ☐ 02 VP, Gen. Mgr.
- ☐ 03 Marketing Manager
- ☐ 04 Business Manager
- ☐ 05 Sales Manager
- ☐ 06 Project Manager
- ☐ 07 Data Processing Manager
- ☐ 08 MIS Director
- ☐ 09 Systems Analyst
- ☐ 10 Engineer
- ☐ 11 Educator
- ☐ 12 Bus. Microcomputer Specialist

C. How many employees does your company employ?

- ☐ 01 Over 5000
- ☐ 02 2500-4999
- ☐ 03 1000-2499
- ☐ 04 250-999
- ☐ 05 100-249
- ☐ 06 25-99
- ☐ 07 10-24
- ☐ 08 Under 10

D.What department are you in?

- ☐ 01 Accounting
- ☐ 02 Administration Management
- ☐ 03 Communications
- ☐ 04 Data Processing
- ☐ 05 EDP/MIS
- ☐ 06 Education/Training
- ☐ 07 Engineering
- ☐ 08 Finance
- ☐ 09 Marketing
- ☐ 10 Operations
- ☐ 11 Personnel
- ☐ 12 Production/Plant
- ☐ 13 Purchasing
- ☐ 14 Research & Development
- ☐ 15 Sales
- ☐ 16 Other

E. What is your department's estimated budget for computer and computer related peripherals for the next 12 months?

- ☐ 01 Over $500,000
- ☐ 02 250,000 to 499,999
- ☐ 03 100,000 to 249,999
- ☐ 04 50,000 to 99,999
- ☐ 05 25,000 to 49,999
- ☐ 06 10,000 to 24,999
- ☐ 07 Under 10,000

F. Through what channels will your department purchase its computers and peripherals?

- ☐ 01 Computer Retail Store
- ☐ 02 Distributor /Wholesaler
- ☐ 03 Value Added Reseller
- ☐ 04 Consultant
- ☐ 05 Mail Order
- ☐ 06 Manufacturer
- ☐ 07 Other

G. How are you involved in your company's purchasing decisions?

- ☐ 01 I approve purchase
- ☐ 02 I specify product and vendor
- ☐ 03 My opinions influence purchase
- ☐ 04 I do not influence purchasing

H. For how many personal computers do you have this involvement?

- ☐ 01 1 to 5
- ☐ 02 6 to 10
- ☐ 03 11 to 25
- ☐ 04 26 to 50
- ☐ 05 51 to 100
- ☐ 06 100 or more

I. Does your company have personal computers?

☐ 01 Yes ☐ 02 No

IA. Currently Own
IB. Plan to purchase within next 12 months.

IA	IB	
		BRAND NAME COMPUTER
		AT
		286
		386 SX
		386
		486
		COMPATIBLE
		AT
		286
		386 SX
		386
		486
		MACINTOSH
		Mac SE or below
		Mac II up
		Amiga
		Atari
		Mainframe
		Mini System
		Network

PERSONAL DATA
(PLEASE PRINT)

Your Company Name ________

Your Name ________

Title ________

Address ________

City/State/Zip ________

Your Signature ________ Phone # ________

Date

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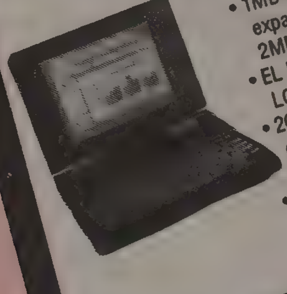

- CMOS 80286 running at 12 MHz
- 1MB standard, expandable to either 2MB or 5MB
- EL backlit supertwist LCD, VGA Text Font
- 20 MB hard disk drive (23msec average access)
- 3.5" internal floppy disk drive

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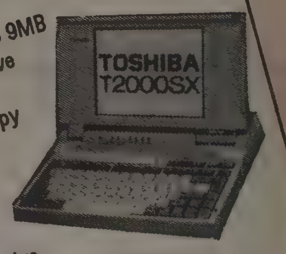
PC 6220
- 286-12 MHz
- 20MB hard drive
- 4.4 lbs.
- Supertwist LCD VGA

PC 6641
- 386SX/20
- 40MB hard drive
- Supertwist LCD VGA
- Int. 1.44 floppy
- 5.9 lbs.

TOSHIBA



T2000SX
- 386SX
- 1MB expandable to 9MB
- 20/40MB hard drive
- 16 levels VGA
- 3.5" internal floppy
- 6.9 lbs.

T1200XE
- 286-12 MHz
- 20MB hard drive
- 1MB expandable to 5MB
- 7.9 lbs. LCD display

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- 386SX-16MHz
- 1MB
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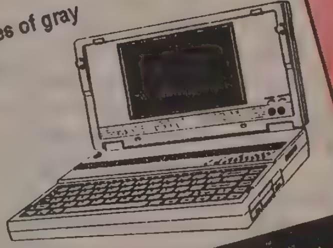
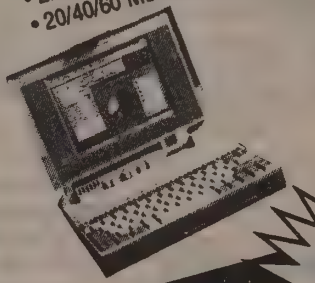


AST

Premium® Exec™
- 386SX/20
- VGA with 32 gray shades
- 2MB RAM
- 20/40/60 MB hard drive



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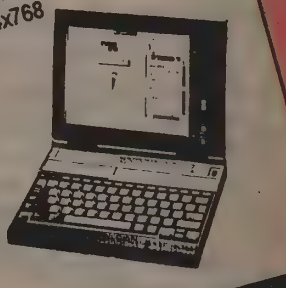

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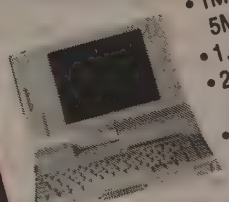

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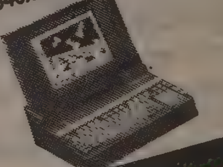

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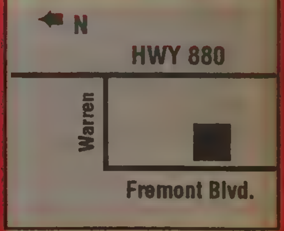

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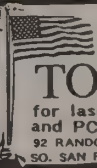

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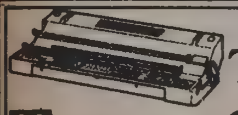

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Check the MicroTimes Calendar of Events in this issue for computer-related classes, seminars, and shows in your area.

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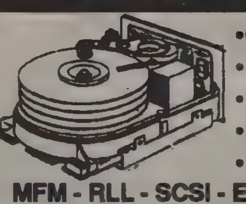

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Continued from page 218

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August 20 Discovering The Power Of Quattro Pro Seminar. Hyatt Palo Alto. Dun & Bradstreet. Call: (212)312-6880.

August 20 Paradox Class. Walnut Creek. Computer Education Center. Call: (415)937-2566.

August 21 Discovering The Power Of Quattro Pro Seminar. Holiday Inn Union City. Dun & Bradstreet. Call: (212)312-6880.

August 21 Real Estate Management With Platinum Series Software Seminar. Stockton. Howard M. Haberman Associates, Inc. Call: Howard M. Haberman, (415)641-0850.

August 21–23 FoxPro 2.0 Training Seminar. UC Berkeley. CMB Software. Call: (415)465-7815.

August 22 Discovering The Power Of Quattro Pro Seminar. Walnut Creek. Dun & Bradstreet. Call: (212)312-6880.

August 22 Quark Xpress I Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 22–23 MacApp Programming Using C++ Course. Techmart. UC Extension. Call: (408)427-6636.

August 23 Discovering The Power Of Quattro Pro Seminar. Sacramento. Dun & Bradstreet. Call: (212)312-6880.

August 23 Intro To Microsoft Works Database Class. San Francisco. Media Alliance's Computer Access. Call: (415)771-7133.

August 24 Building A PC From Scratch Workshop. Oakland. Excel Micro Solutions. Call: (415)836-2040.

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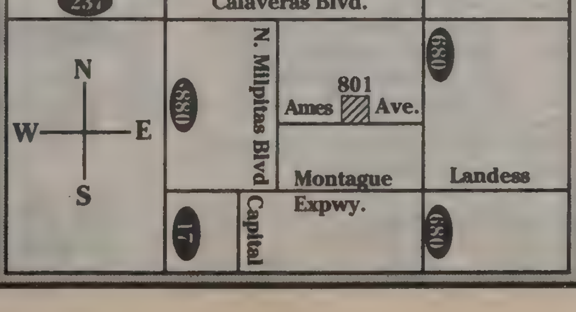

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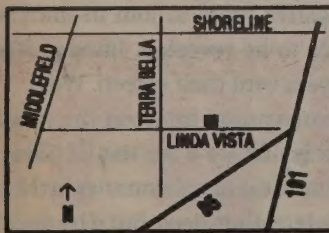

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Badgering The Rich And Famous

Or Let's Watch Them Harass Bill Gates And Let's See What Happens

BY JOHN C. DVORAK

Who can resist imagining that billionaire Microsoft Chairman Bill Gates is getting paranoid and crazy, turning into another Howard Hughes?

This wishful thinking is why there has been a big to-do over the articles in the *Wall Street Journal*, the *San Jose Mercury*, and elsewhere about how Bill is seeing an imaginary grandiose battle emerge. In the bad corner, wearing black is *The Known Universe*. In the good corner, under siege and wearing blue, is Microsoft.

According to some reports Gates has written a memo describing the problem, "Our nightmare—IBM 'attacking' us in system software, Novell Inc. 'defeating' us in networking and more agile, customer-oriented applications competitors getting their Windows act together—is a reality."

In the memo, Gates told his senior staff to try not to publicly criticize IBM, encouraging them to "not attack IBM as a company, and even our public 'attacks' on (IBM's) OS/2 will be very professional...Our strategy for the '90s is Windows—one evolving architecture, a couple of implementations. Everything we do should focus on making Windows more successful." After saying all that, he goes on to say that the split with IBM was a good thing because Microsoft will no longer have to accept "poor code, poor design, and other overhead."

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Anyway, the point of this coverage is that the media have finally realized that Bill Gates has not only become one of the richest men in the world—and at an earlier age than anyone ever!!—but he's shown himself to be a formidable businessman. It's time the media tested his mettle.

The media have been very gentle with Bill for years. He's an unimposing fellow. He loves the business he's in. He is self-deprecating, always saying that if he was dead broke he could always become a coder and he wouldn't care. He's not flashy like many current rich guys, and he even flies in coach to set an example for the employees.

The programmers who work for him worship him as a god, and he is surrounded by a likeable bunch of guys who are all young and seemingly normal. Steve Balmer, Gates's old pal, is a VP and a company spokesman. I can't imagine anyone ever disliking Balmer. Balmer may be Svengali for all I know. It's just that he never seems to lose his cool and is the kind of guy you wouldn't mind having a beer with. He seems to always be traveling and is a bit hyper, but those are hardly spiteful flaws.

The new President of the Company, Mike Hallman, is about as peaceful a guy as you could imagine. Smart, relaxed. He's a little older and more fatherly than the rest of the upper echelon at Microsoft, but unlike executives at IBM and elsewhere, he's not cocky.

Once you drop a couple of layers into the structure at Microsoft, that's where you run into some cocky guys. I've never been able to figure out where this "attitude" comes from. Having worked for and with large corporations, I know that the attitude of the lower employees always comes from above. If you find a company who has a jerk for a receptionist, you can be sure that every boss up the line is a jerk right until you hit the CEO.

Magazines are similar to this. The editor sets the tone for the rest of the writers and associates. The magazine is always a reflection of the top guy. If you want to see how this works, just watch *PC Magazine* make a slow transition over the next year. Michael Miller, whom I've known for years at *Infoworld*, is the new editor in chief, replacing Bill Machrone, who has been kicked upstairs. Machrone set the tone, and the magazine, for better or worse, was a reflection of his ideas and determinations. He's leaving having made the magazine one of the thickest, most popular, and most profitable in history. Michael's magazine will eventually be different, probably not better and not worse—just different.

The nature of the organization will be changed because the day-to-day decisions about little things like color and where articles are placed, who reports to whom, who is hired, etc. creates an atmosphere and a personality at the magazine that is eventually reflected in its pages.

All companies have this nature, and the personality of the company is reflected in the people and the products. Microsoft is no different. If something is wrong with a company, it can always be traced to the top. One has to assume that while Bill and his boys are unassuming and pretty average kinds of guys, the arrogance seen on the lower echelons is a reflection of some sort of neurosis within the individuals in the executive suite.

There is no question that Bill Gates and his comrades are one of the most competitive group of guys in the history of business. Gates either hates to lose or has never learned how to lose gracefully. To compensate for this he just doesn't lose and doesn't have to worry about it. Unfortunately this can't go on forever, and this rift with IBM is bringing out the flaws in his thinking regarding winning and losing.

Meanwhile, the bloodthirsty media, which always hanker to stomp on success and successful people, are finding Gates an interesting target. The media work in strange ways. They love to see what people are made of by putting the spotlight on them and watching what happens. The reaction makes the man (or woman). Reporters hope upon hope that they can, with a few simple questions, get a guy to blow up or take a swing at them. It's amazing to watch the media bait a brute like Mike Tyson, for example. Baiting the rich and famous is great sport.

Until the IBM-Microsoft rift, it's been hard for the media to find a grand enough theme to go after Gates. Now it's here. The great battle between IBM and Microsoft. Titans. Paranoia. Billionaires. Dominance and submission. All the elements are there for some good stories. The kind of stories people like to read.

Once the dam breaks and stories begin to flow, the media will pile on Bill Gates like a dirty football team trying to injure the star opponent. Gates will see the media as a "competitor" or an "enemy." This usually triggers the investigative types to join in thinking there is some dark secret that needs to be revealed. Jilted girlfriends start talking. Disgruntled employees vent their spleen. Wow.

It looks to me that the honeymoon between the media and Bill Gates is over. The net result is that we'll see less of Gates in public, which is too bad since he is one of the last visionaries in the business—his speeches always reveal interesting ideas. But if he decides to drop out of sight and take a long vacation, I wouldn't blame him. In fact, I'd recommend it. ■

© 1991 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine and MacUser, and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.

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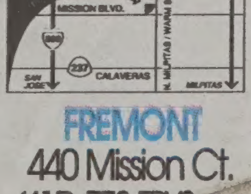

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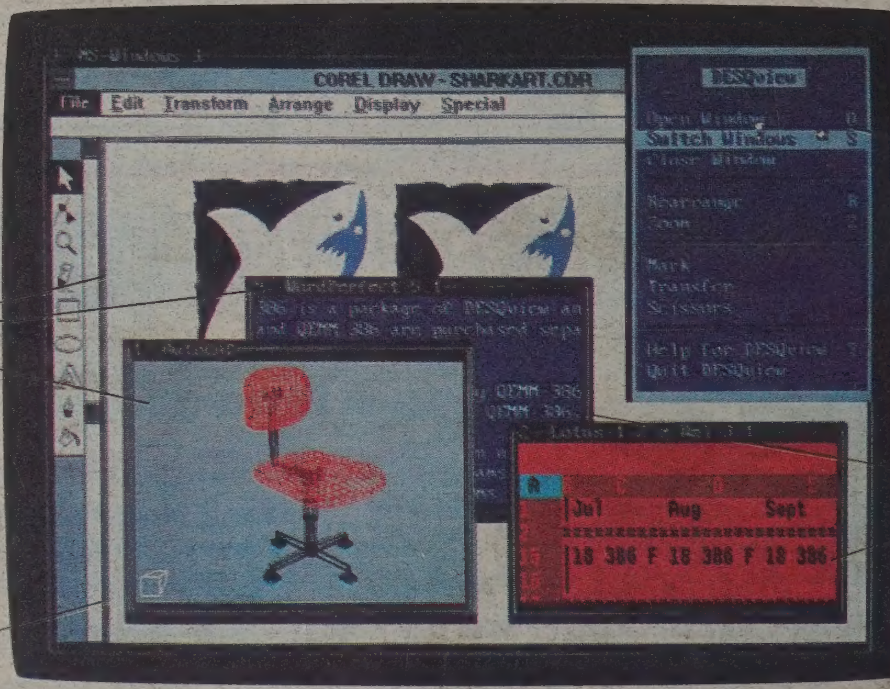
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Scissors
Help for DESQview ?
Quit DESQview

Solve memory problems
QEMM 386 makes the most of every last 'K'. DESQview uses that memory to run multiple programs.

Multitask
Run multiple programs side-by-side in windows. 'Background' programs can continue to run.

See text and graphics side-by-side
Reference information in your graphics program while writing your report.

Run Windows programs
DESQview even lets you run Microsoft Windows.

Easy menu access to programs and DOS services
Access programs or DOS in a window with just a few keystrokes or mouse clicks. It's that simple.

See multiple files
If your programs allow it, DESQview lets you run the same program in two or more windows. Great for comparing fi

Cut and paste data
Transfer data between programs with a few keystrokes.

Handle large programs
Run standard DOS programs side-by-side with DOS-extended programs like 1-2-3 Release 3.

DESQview. The Multitasking, Windowing Environment.

Once the power user's secret, DESQview has been discovered by computer knowledgeable people everywhere. Over 1,000,000 people have bought DESQview.

Multitasking; windowing, using keyboard or mouse commands, it's all easy with DESQview.

DESQview 386 2.3 lets you use your favorite DOS and DOS-extended programs in windows side-by-side on 386SX, 80386 and i486 PCs. As you can see above, you can even run Microsoft Windows within DESQview.

INFO WORLD Product of the Year 1986, 1987, 1988, 1989
PC WORLD BEST BUY
PC MAGAZINE EDITORS' CHOICE
PC MAGAZINE EDITORS' CHOICE
PC MAGAZINE EDITORS' CHOICE
PCComputing MVP MOST VALUABLE PRODUCT 1990

DESQview 2.3 gives 8088, 8086 and 286 PCs with additional memory most of the same capabilities with surprisingly little performance trade-off.

Whatever programs you use—DOS, extended DOS or Windows—and whatever hardware you have, whether 8088 or i486 or something in between, DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. When you look into it, it's the obvious choice.

Quarterdeck

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